DOCUMENT RESUME

ED 311 829 HE 022 921

TITLE	Research and Development Funding in New England. Facts about New England Colleges, Universities, and Institutes. Supplementary Higher Education Data.
INSTITUTION	New England Board of Higher Education, Boston, MA.
PUB DATE	88
NOTE	80p.
AVAILABLE FROM	New England Board of Higher Education, 45 Temple Place, Boston, MA 02111 ($10.00).
PUB TYPE	Statistical Data (110) -- Reports - Descriptive (141)
EDRS PRICE	MF01/PC04 Plus Postage.
DESCRIPTORS	Biomedicine; Educational Development; *Educational Finance; Federal Aid; *Financial Support; Higher Education; Innovation; Medical Schools; Regional Planning; *Research and Development; Technological Advancement
IDENTIFIERS	*New England

ABSTRACT

An analysis of research and development (R&D) funding in New England is presented in four sections: (1) total federal obligations for R&D to the region (e.g., New England received 8.8% of all federal obligations for R&D that were made nationally in 1986, and of the 1986 funds obligated nationally to colleges and universities, over 11% were awarded in New England); (2) federal obligations to colleges and universities through 1986 (e.g., the New England region ranked first when federal obligations to all U.S. colleges and universities were analyzed on a per-capita basis, and 10 New England institutions of higher education rank among the 100 receiving the largest amounts nationally); (3) R&D expenses at doctorate granting colleges and universities through 1986 (e.g., R&D expenditures at New England institutions of higher education are higher on a per-capita basis than in any other region, and though the Federal Government remains the major source for R&D funds expended by New England colleges and universities, they were less so in 1986 than in 1981); and (4) biomedical R&D: National Institutes of Health (NIH) funding awards through 1987 (e.g. in terms of NIH awards to all domestic institutions in 1987, 15 New England organizations ranked among the top 100 nationally, and 65% NIH funds to New England were awarded to medical schools and teaching hospitals). While New England fared well in R&D funds in 1986, it was not without a few comparative disadvantages that must be taken into public policy consideration. (SM)

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RESEARCH AND DEVELOPMENT
FUNDING IN NEW ENGLAND

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RESEARCH AND DEVELOPMENT
FUNDING IN NEW ENGLAND

Facts about Research and Development Funding in New England
is published by the New England Board of Higher Education
45 Temple Place, Boston, Massachusetts 02111. 617/357-9620.
Copies of the 1988 edition are $10.00 each.

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RESEARCH AND DEVELOPMENT FUNDING IN NEW ENGLAND

Executive Summary

U.S. funding of basic and applied research has not only assisted in sustaining a prosperous economy over the years, it has created a government, business and academic partnership responsible for the nation's international leadership in scientific and technological discoveries. Since World War II, federal support for basic and applied research has grown substantially, and New England organizations have been leading recipients of those funds.

In 1986, the most recent year for which data is presently available, R&D funding in New England, for the most part, remained strong. When analyzed by scale, relative to regional population, New England ranked number one in the United States in federal obligations directed to universities and colleges, in R&D expenditures at universities and colleges and in biomedical R&D funding awards from the National Institutes of Health.

The analysis of regional R&D funding covers four major areas as follows:

Total Federal Obligation for R&D to the Region

New England slipped from first in 1985 to third in 1986 (preceded by the Mountain and Pacific States) in total federal R&D obligations to industry, state or local government, non-profit institutions, Federally Financed Research and Development Centers (FFRDCs) and other federal government centers/departments/agencies, as well as to universities and colleges. This reflects a regional decline in total federal obligations of almost 3 percent from the 1985 level of funding. Though Rhode Island's gain of almost 18 percent was substantial, it is chiefly Connecticut's decline of more than 22 percent that accounts for the regional loss. In addition, the total obligations to organizations in Massachusetts remained at relatively the same level as the 1985 figures.

New England received 8.8 percent of all federal obligations for R&D that were made nationally in 1986. This includes 13.2 percent of total awards made by the Department of Transportation (DOT), 11.7 by Health and Human Services (HHS), 11 by the National Science Foundation (NSF), 10.2 from the Environmental Protection Agency (EPA), and 9.9 from the Department of Defense (DOD). The 1986 levels are higher than those of 1985 from the DOT, EPA and NSF. The proportion of HHS obligations remained exactly the same, while our 1986 DOD awards declined by 1.5 from the 11.4 percent level of 1985.

The largest receiver of total federal R&D obligations that come to the region is the industrial sector, with 52.7 percent, followed by universities and colleges, which received 16.2 percent, federal government operations of the region at 13 percent, and non-profit institutions, with 11.4 percent of the total. The industrial, university and non-profit figures exceed the national averages.

Of the 1986 funds obligated nationally to colleges and universities, over 11 percent were awarded in New England. Likewise, 32.4 percent went to our non-profit institutions, 9.5 percent to industry and over 32 percent to non-profit FFRDCs.

Massachusetts still ranks third in total obligations and in obligations made by the Department of Defense. The Bay State did, however, drop from second in 1985 to fourth in 1986 in funding from the Department of Health and Human Services, and from second to 12th in funding from NASA. Connecticut, on the other hand, improved its 1985 ranking of 22 from DOD, 14 from HHS and 35 from NASA to 18, 11 and 11, respectively, in 1986.

Federal Obligations to Universities and Colleges

Not only did the New England region rank first when federal obligations to all universities and colleges across the nation were analyzed on a per-capita basis, but the region that ranked second had a per-capita obligation which is almost $36.00 less than that of New England's. With only 5.3 percent of the U.S. population, New England captured 9.3 percent of R&D funds that were awarded to universities and colleges nationally.

Universities and colleges received a substantial amount of total awards made from several agencies. Almost 20 percent of the Department of Energy's (DOE) university awards nationally came to New England, while 16.4, 12.9, 11.3, 10.5, 9.8 and 8.7 percent of total awards from the Department of Commerce (COM), NSF, HHS, EPA, DOD, and NASA, respectively, were awarded here.

In terms of total obligations, colleges and universities receive their largest regional share from HHS (39.6 percent), followed by Education (22.5 percent), Defense (10.8 percent), and the NSF (9.1 percent).

Ten New England institutions of higher education rank among the 100 receiving the largest amounts nationally. They include M.I.T., Harvard, Yale, Boston University, U. Mass at Amherst, U.Conn, Brown, Woods Hole, Tufts and the University of Vermont with rankings of 2, 13, 14, 39, 66, 67, 72, 78, 92 and 94, respectively. In addition, 80 universities and colleges receive $1 million or more in U.S. R&D funds.

The major proportion of Connecticut's funds (more than 65 percent) come from the Department of Health and Human Services. Though Massachusetts' institutions of higher education receive their largest share from HHS (36.5 percent), they also receive a substantial amount from Education (19.4 percent), the National Science Foundation (14.9 percent) and the Department of Defense (14.1 percent).

Rhode Island colleges and universities receive almost 29 percent of their federal obligations from the Department of Education (ED), 20.1 percent from the NSF and 17.3 percent from HHS.

The major agency awarding funds to Maine is ED. Almost 76 percent of all awards to Maine institutions of higher education come from this department. In addition, a larger share of funds awarded to universities and colleges in Maine (11.8 percent) than in any other New England state are awarded from the Department of Agriculture. Vermont is split equally in its awards from the ED and HHS with 44 and 42.5 percent, respectively. Finally, the majority of New Hampshire's funds are awarded from HHS (36.1 percent) and ED (23.3 percent).

R&D Expenditures at Colleges and Universities

Similar to the case for federal obligations to colleges and universities, R&D expenditures at New England institutions of higher education are higher on a per-capita basis here than in any other region. With only 5.3 percent of the nation's population, 9.4 percent of total higher education R&D expenditures are made by New England institutions.

Though the federal government remains the major source for R&D funds expended by New England colleges and universities, they were less so in 1986 than in 1981. Industry has increased its share of funds to the region by almost 3 percent, while the federal government's share decreased by 5.9 percent. Use of institutional funds increased by 2.1 percent and funds from all other sources increased by 1.1 percent. State and local government's share, already quite low, decreased slightly.

Life sciences is the discipline in which the greatest share of R&D expenditures is made. Almost 90 percent of Vermont's expenditures, almost 69 percent of Connecticut's and 65 percent of Maine's are in the life sciences. Approximately 55 percent of New Hampshire's expenditures are in the life sciences, while 37 percent of Massachusetts' are. The Bay State also sees a large proportion of funds allotted to engineering (21.6 percent) and the physical sciences (19.1). New Hampshire and Connecticut also have substantial shares of R&D expenditures made in the physical sciences, with 17.5 and 13.5 percent, respectively.

Rhode Island colleges and universities saw their largest share of 1986 R&D expenditures made in the environmental sciences (36.9 percent), followed by the life sciences and engineering with 22.3 and 18.3 percent, respectively.

Massachusetts and Connecticut ranked in the top half nationally in terms of total R&D expenditures in 1986, with Massachusetts ranking fourth and Connecticut 16th. Both have seen a decline from their third and 15th place rankings in 1981.

Biomedical R&D: National Institutes of Health Funding Awards Through 1987

In both 1986 and 1987 the New England region lead the nation in per-capita R&D awards. With a national average of $21.20 in 1987, New England's average was substantially higher, at $59.91.

In terms of NIH awards to all domestic institutions (national research labs, colleges/universities, medical schools, hospitals, non-profit institutes and companies) in 1987, fifteen New England organizations ranked among the top 100 nationally. Yale ranked third in total funds awarded, while Harvard ranked sixth, M.I.T. ranked 24th and Mass. General Hospital ranked 25th. Yale ranked third nationally in total dollars awarded to universities, while Harvard ranked sixth. Yale and Harvard medical schools are also ranked in the top fifteen medical schools nationally, while six of the top ten independent hospitals that received 1987 funds are in New England.

The major share of NIH funds to New England (65 percent) were awarded to medical schools and teaching hospitals. Colleges and universities (excluding medical schools) received approximately 20 percent, while non-profit organizations (research institutes, hospital associations, research centers, etc.), state-government departments and private companies received approximately 14 percent.

Summary Comments

While New England fared well in R&D funds in 1986, it was not without a few comparative disadvantages that must be taken into public policy consideration. Though a leader in per-capita awards from the NIH and from the federal government in general to universities, as well as a leader in overall university-based R&D expenditures from all sources, the region's drop from first to third in total obligations per-capita is cause for concern. Moreover, the region's share of R&D funds and expenditures as portions of U.S. totals has declined slightly in both 1985 and 1986 from their 1980 and 1981 levels. Likewise, NIH funds as a portion of total awards nationally have also declined slightly. As colleges and universities across the United States seek to gain national stature in basic research activity, New England institutions will increasingly face strong competition in maintaining their current leadership position in R&D funding.

At the same time, while strong efforts at the state level are being made across the nation, the New England states, with the exception of Vermont and New Hampshire, have been weak in R&D funding (see Charts 37, 38 and 39).

Likewise, though New England's share of all industrial funding awarded nationally to colleges and universities increased from 10.6 in 1981 to 12.4 percent in 1985, it dropped to 11.1 percent in 1986.

New England must review its competitive leadership position in R&D investment in order to maintain its national edge. Long-term commitment to R&D in universities as well as industry remains a significant element in maintaining technological prominence here in New England.

Judith Beachler
Director of Research Services
October, 1988

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A. FEDERAL OBLIGATIONS FOR RESEARCH AND DEVELOPMENT THROUGH 1986

Note: The charts included in this section reflect analyses of data provided by the National Science Foundation, indicative of federal funding provided to universities/colleges, industry, state and local government, non-profit institutions, Federally Funded Research and Development Centers (FFRDCs), and to other federal government centers/departments/agencies. Obligations differ from expenditures in that funds allocated during the fiscal year may be spent by the recipient either partially or entirely during one or more subsequent years. NSF data on research and development include obligations of the major R & D-support agencies in that year and represent 95 percent or more of the total federal R & D obligation. They include the Departments of Agriculture, Commerce, Defense, Energy, Health & Human Services, Interiors and Transportation, the Environmental Protection Agency, National Aeronautics & Space Administration, and the National Science Foundation.

1. A Regional Comparison of Federal Obligations for Total Research and Development: 1985 and 1986

1985

	Obligation in Thousands of $	% of Total Fed. R & D Obligation	% of U.S. Pop.++	Per Capita Obligation In Dollars	Per Capita Obligation National Rank
New England	4,549,672	9.6	5.3	359.37	1
Middle Atlantic	6,243,806	13.2	15.6	167.85	5
East North Central	3,216,483	6.8	17.4	77.24	8
West North Central	1,778,416	3.8	7.4	101.31	7
South Atlantic	11,140,731	23.6	16.8	276.95	4
East South Central	1,690,981	3.6	6.3	111.82	6
West South Central	1,893,593	4.0	11.1	71.43	9
Mountain	4,502,625	9.5	5.4	352.07	2
Pacific	12,061,558	25.6	14.7	344.25	3
Outlying Areas	62,376	.1			
Offices Abroad	35,941	.1			
U.S.	47,176,182	100.0	100.0	197.60	

1986

	Obligation in Thousands of $	% of Total Fed. R & D Obligation	% of U.S. Pop.+	Per Capita Obligation In Dollars	Per Capita Obligation Nat'l Rank	1-Year Gain In Percent
New England	4,422,120	8.8	5.3	347.19	3	-2.8
Middle Atlantic	6,245,687	12.4	15.4	167.53	5	*
East North Central	3,273,493	6.5	17.2	78.43	9	1.8
West North Central	1,612,662	3.2	7.2	91.75	7	-9.3
South Atlantic	12,084,895	24.0	17.1	295.36	4	8.5
East South Central	1,982,479	3.9	6.3	130.35	6	17.2
West South Central	2,118,306	4.2	11.1	78.85	8	11.9
Mountain	5,578,530	11.1	5.4	428.36	1	23.9
Pacific	12,896,039	25.6	15.0	360.86	2	6.9
Outlying Areas	36,792	*				-41.0
Offices Abroad	59,210	.1				64.7
U.S.	50,310,213	100.0	100.0	208.69		6.6

*Less than .05 percent.

Note: Figures may not add up to 100 percent, due to rounding.

Sources: NEBHE Analysis (10/86 and 6/88) of data from the National Science Foundation, Federal Funds for Research and Development, Fiscal Years: 1985, 1986 and 1987; U.S. Department of Commerce, Bureau of the Census, Statistical Abstract of the United States, 1987 and 1988.

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2. Federal Obligations for Total Research and Development: 1969 to 1986
To the New England States

(In thousands of dollars)

	1969	1973	1977	1981	1985	1986
CT	223,574	193,864	291,766	485,047	742,935	577,288
MA	775,009	953,615	1,472,015	2,407,111	3,268,701	3,239,665
RI	32,871	59,276	110,078	182,478	333,953	392,593
ME	14,299	9,593	18,270	24,371	36,585	35,610
NH	31,042	30,560	32,585	54,765	129,704	135,883
VT	8,994	17,517	36,623	18,734	37,794	41,081
N.E.	1,085,789	1,264,425	1,961,337	3,172,506	4,549,672	4,422,120
U.S.	15,354,563	16,486,064	22,841,069	31,929,601	47,176,182	50,310,213

Source: The National Science Foundation, Federal Funds for Research and Development, Fiscal Years 1969, 1973, 1977, 1981, 1985 and 1986.

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3. Federal Obligations for Total Research and Development: 1986
To the New England States
4-Year, 8-Year, 12-Year and 16-Year Gain

(In percent)

	1985-1986 1-Year Gain	1985-1986 5-Year Gain	1977-1986 9-Year Gain	1973-1986 13-Year Gain	1969-1986 17-Year Gain
CT	-22.3	19.0	97.9	197.8	158.2
MA	-.01	34.6	120.1	239.7	318.0
RI	17.6	115.1	256.6	562.3	1094.3
ME	-2.7	46.1	94.9	271.2	149.0
NH	4.8	148.1	317.0	344.6	337.7
VT	8.7	119.3	12.2	134.5	356.8
N.E.	-2.8	39.4	125.5	249.7	307.3
U.S.	6.6	57.6	120.3	205.1	227.7

Source: NEBHE Analysis (10/86 and 6/88) of data from the National Science Foundation, Federal Funds for Research and Development, Fiscal Years 1969, 1973, 1977, 1981, 1985 and 1986.

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4. Federal Obligations for Research and Development: 1980, 1985 and 1986
Total Obligation and National Rank +
The New England States

(In thousands of dollars)

	1980		1985		1986	
	Total Obligation	National Rank	Total Obligation	National Rank	Total Obligation	National Rank
CT	470,281	19	742,935	16	577,288	19
MA	2,066,738	3	3,268,701	3	3,239,665	3
RI	149,930	31	333,953	25	392,593	25
ME	25,936	49	36,585	45	35,610	46
NH	50,196	42	129,704	35	135,883	33
VT	51,272	41	37,794	44	41,081	44
N.E.	2,814,353		4,549,672		4,422,120	
U.S.	30,477,266		47,176,182		50,310,213	

+Rank per total federal obligation for research and development to the 50 states and the District of Columbia.

Source: The National Science Foundation, Federal Funds for Research and Development, Fiscal Years: 1980, 1981 and 1982; 1985, 1986 and 1987; 1986, 1987 and 1988.

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5. Federal Obligations for Research and Development: 1986
Total Obligation by Agency
To Each New England State

(In thousands of dollars)

	Total	USDA	COM	DOD	DOE	HHS	INT	DOT	EPA	NASA	NSF
CT	577,288	3,728	4,015	343,399	14,363	121,547	1,344	9,347	3,795	62,921	12,829
MA	3,239,665	14,683	13,006	2,451,879	61,877	471,083	3,100	40,642	22,495	53,941	106,959
RI	392,593	1,477	2,808	340,651	2,704	22,825	829	216	4,629	1,777	14,677
ME	35,610	3,121	1,500	14,203	125	9,755	1,187	275	905	486	4,053
NH	135,883	3,253	886	98,135	853	16,714	1,425	344	267	5,519	8,487
VT	41,081	3,293	40	10,322	5,200	17,939	1,126	122	255	1,429	1,355
N.E.	4,422,120	29,555	22,255	3,258,589	85,122	659,863	9,011	50,946	32,346	126,073	148,360
U.S.	50,310,213	920,328	398,207	32,841,027	4,682,923	5,632,178	384,326	385,431	317,319	3,396,650	1,351,824

Source: The National Science Foundation, Federal Funds for Research and Development, Fiscal Years 1986, 1987 and 1988.

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6. Federal Obligations for Total Research and Development: 1980, 1985, and 1986
Percent Distribution by Agency
in Each New England State

1980

	Total %	USDA	COM	DOD	DOE	HHS	INT	DOT	EPA	NASA	NSF
CT	100.	.7	.5	49.4	3.8	15.4	.3	1.7	.7	25.2	2.4
MA	100.	.3	.6	70.1	4.6	13.7	.7	2.3	.6	3.4	3.7
RI	100.	.6	1.3	76.0	2.3	8.8	.4	.2	1.8	1.0	7.5
ME	100.	11.8	4.5	15.8	6.6	28.4	6.5	9.5	4.8	.9	11.3
NH	100.	5.6	2.0	55.3	4.7	17.7	3.0	.6	1.1	3.8	6.2
VT	100.	3.8	2.3	68.3	.2	20.7	1.2	.2	1.5	.7	1.1
N.E.	100.	.6	.7	66.1	4.3	14.0	.7	2.1	.7	6.9	3.7
U.S.	100.	2.2	1.1	45.7	15.6	12.3	1.3	1.2	1.1	16.5	2.9

1985

	Total %	USDA	COM	DOD	DOE	HHS	INT	DOT	EPA	NASA	NSF
CT	100.	.6	.4	63.5	2.5	15.9	.2	1.3	.5	13.2	2.0
MA	100.	.5	.6	76.0	2.0	13.8	.1	1.3	.7	1.7	3.3
RI	100.	.4	.7	85.7	.9	6.2	.4	*	1.5	.4	3.9
ME	100.	9.8	2.6	42.0	1.7	26.0	3.4	1.3	.7	1.1	11.4
NH	100.	2.5	.7	77.7	.5	10.8	1.0	.1	.2	4.0	2.5
VT	100.	8.8	.2	35.5	.3	46.9	2.9	2.3	.3	.2	2.6
N.E.	100.	.7	.6	74.1	2.0	13.9	.2	1.2	.7	3.5	3.2
U.S.	100.	2.0	.8	63.0	10.5	11.5	.8	.9	.7	7.0	2.8

1986

	Total %	USDA	COM	DOD	DOE	HHS	INT	DOT	EPA	NASA	NSF
CT	100.	.6	.7	59.5	2.5	21.1	.2	1.6	.7	10.9	2.2
MA	100.	.5	.4	75.7	1.9	14.5	.1	1.3	.7	1.7	3.3
RI	100.	.4	.7	86.8	.7	5.8	.2	.1	1.2	.5	3.7
ME	100.	8.8	4.2	39.9	.4	27.4	3.3	.8	2.5	1.4	11.4
NH	100.	2.4	.7	72.2	.6	12.3	1.0	.3	.2	4.1	6.2
VT	100.	8.0	.1	25.1	12.7	43.7	2.7	.3	.6	3.5	3.3
N.E.	100.	.7	.5	73.7	1.9	14.9	.2	1.2	.7	2.9	3.4
U.S.	100.	1.8	.8	65.3	9.3	11.2	.8	.8	.6	6.8	2.7

Note: The federal obligations of the ten major R & D supporting agencies listed above represent more than 95 percent of total obligations in 1986, more than 97 percent in 1985 and more than 98 percent in 1986.
Figures may not add to 100 percent due to rounding.

*Percent is less than .05.

Source: The National Science Foundation, Federal Funds for Research and Development, Fiscal Years: 1980, 1981 and 1982; 1985, 1986, 1987; and 1986, 1987 and 1988.

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7. Federal Obligations for Total Research and Development 1980, 1985 and 1986
Percent Distribution by State
Of Each Agency's Funds

1980

	Total $	USDA	COM	DOD	DOE	HHS	INT	DOT	EPA	NASA	NSF
Agency Total	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.
CT	1.5	.5	.7	1.7	.4	1.9	.3	2.2	.9	2.4	1.3
MA	6.8	.9	3.8	10.4	2.0	7.5	3.6	13.4	3.4	1.4	8.6
RI	.5	.1	.6	.8	.1	.4	.2	.1	.8	*	1.3
ME	.1	.5	.3	*	*	.2	.4	.7	.4	*	.3
NH	.2	.4	.3	.2	.1	.2	.4	.1	.2	*	.4
VT	.2	.3	.3	.3	*	.3	.2	*	.2	*	.1
N.E.	9.2	2.6	6.0	13.4	2.6	10.5	5.0	16.5	5.9	3.8	11.9

1985

	Total $	USDA	COM	DOD	DOE	HHS	INT	DOT	EPA	NASA	NSF
Agency Total	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.
CT	1.6	.4	.8	1.6	.4	2.2	.3	2.4	1.1	3.0.	1.1
MA	6.9	1.7	4.6	8.4	1.3	8.4	.9	10.3	6.9	1.7	8.1
RI	.7	.2	.6	1.0	.1	.4	.3	*	1.5	*	1.0
ME	.1	.4	.2	.1	*	.2	.3	.1	.1	*	.3
NH	.3	.3	.2	.3	*	.3	.3	*	.1	.2	.2
VT	.1	.4	*	*	*	.3	.3	.2	*	*	.1
N.E.	9.6	3.4	6.5	11.4	1.8	11.7	2.4	13.1	9.8	4.8	10.8

1986

	Total $	USDA	COM	DOD	DOE	HHS	INT	DOT	EPA	NASA	NSF
Agency Total	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.
CT	1.1	.4	1.0	1.0	.3	2.2	.3	2.4	1.2	1.9	.9
MA	6.4	1.6	3.3	7.5	1.3	8.4	.8	10.5	7.1	1.6	7.9
RI	.8	.2	.7	1.0	.1	.4	.2	.1	1.5	.1	1.1
ME	.1	.3	.4	*	*	.2	.3	.1	.3	*	.3
NH	.3	.4	.2	.3	*	.3	.4	.1	.1	.2	.6
VT	.1	.4	*	*	.1	.3	.3	*	.1	*	.1
N.E.	8.8	3.2	5.6	9.9	1.8	11.7	2.3	13.2	10.2	3.7	11.0

Note: The federal obligations of the ten major R & D supporting agencies listed above represent more than 95 percent of total obligations in 1980, more than 97 percent in 1985, and more than 98 percent in 1986.
Figures may not add to 100 percent due to rounding.

*Percent is less than .05.

Source: The National Science Foundation, Federal Funds for Research and Development, Fiscal Years: 1980 1981 and 1982; 1985, 1986 and 1987; 1986, 1987 and 1988.

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8. Federal Obligations for Total Research and Development: 1985 and 1986
National Ranking of the the New England States
By U.S. Total and Each Agency* Total

1985

	Total	DOD	DOE	HHS	NASA
CT	16	22	21	14	35
MA	3	3	14	2	2
RI	35	21	+	26	32
ME	45	51	39	45	48
NH	35	35	43	43	17
VT	44	45	24	49	47

1986

	Total	DOD	DOE	HHS	NASA
CT	19	18	24	11	11
MA	3	3	14	4	12
RI	25	19	36	32	40
ME	46	36	50	40	42
NH	33	29	43	36	28
VT	44	40	29	33	37

+Received no funds.

*These four agencies are responsible for at least 5% of the total federal obligations in both 1985 and 1986. In total, they accounted for 92.0% and 92.6% of all federal obligations in 1985 and 1986, respectively.

Note: Rankings among the 50 states and the District of Columbia. Outlying areas (Guam, Puerto Rico, American Samoa, the Virgin Islands and the Pacific Islands were excluded from the analysis)

Source: NEBHE Analysis (11/86 and 6/88) of data from the National Science Foundation, Federal Funds for Research and Development, Fiscal Years, 1985, 1986 and 1987; 1986, 1987 and 1988.

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9. Federal Obligation for Total Research and Development by Performer: 1986
in Each New England State

(In thousands of dollars)

	Total	Fed. Gov't	Indus.	FFRDC Ind.	Univ./ Colleges	FFRDC U/C	Non-Profit Insts.	FFRDC Non-Profit	State/Local Gov't
CT	577,288	75,394	346,714	0	146,905	0	6,665	0	1,610
MA	3,239,665	205,383	1,813,111	0	464,384	121,144	467,448	163,654	4,541
RI	392,593	258,919	73,671	0	45,708	0	12,002	0	2,292
ME	35,610	2,349	14,375	0	6,994	0	10,735	0	1,157
NH	135,883	27,933	74,297	0	31,804	0	1,481	0	368
VT	41,081	7,089	6,970	0	22,467	0	4,186	0	369
N.E.	4,422,120	577,067	2,329,138	0	718,263	121,144	502,517	163,654	10,337
U.S.	50,310,213	13,144,647	24,448,100	1,640,236	6,444,758	2,414,347	1,551,052	543,250	123,823

Source: National Science Foundation, Federal Funds for Research and Development: Fiscal Years 1986, 1987 and 1988.

#0218D

10. Federal Obligation for Total Research and Development: 1980, 1985, and 1986
Percent Distribution by R & D Performer
in Each New England State

1980

	Total $	Fed. Gov't	Indus.	FFRDC Ind.	Univ./ Colleges	FFRDC U/C	Non-Profit Insts.	FFRDC Non-Profit	State/Local Gov't
CT	100.	3.4	74.2	0	20.8	0	.8	0	.8
MA	100.	3.9	51.6	0	20.7	5	9.4	4	.4
RI	100	63.9	12.8	0	18.0	0	3.8	0	1.5
ME	100.	14.1	20.7	0	20.5	0	28.1	0	16.6
NH	100.	27.5	34.9	0	34.6	0	.9	0	2.1
VT	100.	22.9	49.7	0	24.0	0	1.7	0	1.7
N.E.	100.	11.5	52.7	0	20.9	3.7	7.6	2.9	.8
U.S.	100.	25.0	47.0	4.2	13.4	5.1	3.0	1.4	.8

1985

	Total $	Fed. Gov't	Indus.	FFRDC Ind.	Univ./ Colleges	FFRDC U/C	Non-Profit Insts.	FFRDC Non-Profit	State/Local Gov't
CT	100.	18.7	59.7	.5	20.1	0	.8	0	.3
MA	100.	5.5	49.4	0	16.6	3.3	16.1	9	.1
RI	100.	68.1	16.4	0	11.7	0	3.3	0	.5
ME	100.	8.2	41.4	0	19.0	0	29.5	0	1.9
NH	100.	27.6	51.2	0	20.9	0	.1	0	.2
VT	100.	6.6	36.3	0	56.0	0	.6	0	.5
N.E.	100.	12.9	48.5	.1	17.3	2.4	12.2	6.5	.2
U.S.	100.	26.6	46.5	3.6	13.0	5.3	3.3	1.4	.2

1986

	Total $	Fed. Gov't	Indus.	FFRDC Ind.	Univ./ Colleges	FFRDC U/C	Non-Profit Insts.	FFRDC Non-Profit	State/Local Gov't
CT	100.	13.1	60.1	0	25.4	0	1.2	0	.3
MA	100.	6.3	56.0	0	14.3	3.7	14.4	5.1	.1
RI	100.	66.0	18.8	0	11.6	0	3.1	0	.6
ME	100.	6.6	40.4	0	19.6	0	30.1	0	3.2
NH	100.	20.6	54.7	0	23.4	0	1.1	0	.3
VT	100.	17.3	17.0	0	54.7	0	10.2	0	.9
N.E.	100.	13.0	52.7	0	16.2	2.7	11.4	3.7	.2
U.S.	100.	26.1	48.6	3.3	12.8	4.8	3.1	1.1	.2

Note: The federal obligations listed above are indicative of support from the 10 federal agencies that represent more than 95 percent of total federal R & D obligations in 1980 and more than 97 percent in 1985, and more than 98 percent in 1986.

Figures may not add to 100 percent due to rounding.

Source: NEBHE Analysis (11/86 and 6/88) of data from the National Science Foundation, Federal Funds for Research and Development, Fiscal Years: 1985, 1986 and 1987; 1986, 1987 and 1988.

#0218D

11. Federal Obligation for Total Research and Development: 1980, 1985, and 1986
Percent Distribution by State
of Each R & D Performer

1980

	Total %	Fed. Gov't	Indus.	FFRDC Ind.	Univ./ Colleges	FFRDC U/C	Non-Profit Insts.	FFRDC Non-Profit	State/Local Gov't
U.S. Total	100.	100.	100.	100.	100.	100.	100.	100.	100.
CT	1.5	.2	2.4	0	2.4	0	.4	0	1.6
MA	6.8	2.4	7.4	0	10.4	6.6	21.5	19.3	3.7
RI	.5	1.3	.1	0	.7	0	.6	0	.9
ME	.1	*	*	0	.1	0	.8	0	1.7
NH	.2	.2	.1	0	.4	0	*	0	.4
VT	.2	.2	.2	0	.3	0	.1	0	.3
N.E.	9.2	4.3	10.3	0	14.4	6.6	23.4	19.3	8.7

1985

	Total %	Fed. Gov't	Indus.	FFRDC Ind.	Univ./ Colleges	FFRDC U/C	Non-Profit Insts.	FFRDC Non-Profit	State/Local Gov't
U.S. Total	100.	100.	100.	100.	100.	100.	100.	100.	100.
CT	1.6	1.1	2.0	.2	2.4	0	.4	0	2.0
MA	6.9	1.4	7.4	0	8.8	4.3	33.9	43.8	4.5
RI	.7	1.8	.2	0	.6	0	.7	0	1.7
ME	.1	*	.1	0	.1	0	.7	0	.7
NH	.3	.3	.3	0	.4	0	*	0	.3
VT	.1	*	.1	0	.3	0	*	0	.2
N.E.	9.6	4.7	10.1	.2	12.8	4.3	35.7	43.8	9.4

1986

	Total %	Fed. Gov't	Indus.	FFRDC Ind.	Univ./ Colleges	FFRDC U/C	Non-Profit Insts.	FFRDC Non-Profit	State/Local Gov't
U.S. Total	100.	100.	100.	100.	100.	100.	100.	100.	100.
CT	1.1	.6	1.4	0	2.3	0	.4	0	1.3
MA	6.4	1.6	7.4	0	7.2	5	30.1	30.1	3.7
RI	.8	2.0	.3	0	.7	0	.8	0	1.9
ME	.1	*	.1	0	.1	0	.7	0	.9
NH	.3	.2	.3	0	.5	0	.1	0	.3
VT	.1	.1	*	0	.3	0	.3	0	.3
N.E.	8.8	4.4	9.5	0	11.1	5	32.4	30.1	8.3

Note: The federal obligations listed above are indicative of support from the 10 federal agencies that represent more than 95 percent of total federal R & D obligations in 1980, more than 97 percent in 1985 and more than 98 percent in 1986.

Figures may not add to 100 percent due to rounding

*Percent is less than .05.

Source: NEBHE Analysis (11/86 and 6/88) of data from the National Science Foundation, Federal Funds for Research and Development, Fiscal Years: 1985, 1986 and 1987; 1986, 1987 and 1988.

#02180

12. A Regional Comparison of Federal Obligations for R & D Plant: 1986

	R & D Plant Obligation in Thousands of $	R & D Plant as % of Total Oblig. to Region	As % of Total Fed. R & D Plant Obligation
New England	24,795	.6	1.7
Atlantic	161,475	2.5	10.9
E. No. Central	120,150	3.5	8.1
W. No. Central	66,222	3.9	4.5
So. Atlantic	239,604	1.9	16.2
E. So. Central	85,834	4.1	5.8
W. So. Central	84,962	3.9	5.7
Mountain	318,581	5.4	21.5
Pacific	362,569	2.7	24.5
Outlying Areas	13,865	27.4	.9
Offices Abroad	4,466	7.0	.3
U.S.	1,482,523		100.0

Source: NEBHE analysis (6/88) of data from the National Science Foundation, Federal Funds for Research and Development, Fiscal Years: 1986, 1987 and 1988.

#0218D

13. Federal Obligation for R & D Plant: 1986
by Agency
to Each New England State

(In thousands of dollars)

	Total	USDA	COM	DOD	DOE	HHS	INT	DOT	NASA	NSF
CT	1,215	0	0	220	400	306	289	0	0	0
MA	17,707	206	0	5,577	11,464	369	0	11	58	22
RI	5,540	0	0	579	4,961	0	0	0	0	0
ME	33	33	0	0	0	0	0	0	0	0
NH	300	0	0	300	0	0	0	0	0	0
VT	0	0	0	0	0	0	0	0	0	0
N.E.	24,795	239	0	6,676	16,825	675	289	11	58	22
U.S.	1,482,523	79,350	9,261	286,132	742,309	37,879	4,342	12,052	258,072	53,126

Note: The federal obligations listed above are indicative of support from the 10 federal agencies that represent more than 95 percent of total federal R & D obligations in 1980, more than 97 percent in 1985 and more than 98 percent in 1986.

Figures may not add to 100 percent due to rounding

Source: NEBHE Analysis (11/86 and 6/88) of data from the National Science Foundation, Federal Funds for Research and Development, Fiscal Years: 1985, 1986 and 1987; 1986, 1987 and 1988.

#0218D

14. Federal Obligation for R & D Plant: 1986
by Performer
in Each New England State

(In thousands of dollars)

	Total	Fed. Gov't	Indus.	Univ./ Colleges	FFRDC U/C	Non-Profit Insts.
CT	1,215	509		706	0	0
MA	17,707	5,533	69	11,486	250	369
RI	5,540	579	0	4,961	0	0
ME	33	33	0	0	0	0
NH	300	300	0	0	0	0
VT	0	0	0	0	0	0
N.E.	24,795	6,954	69	17,153	250	369
U.S.	1,482,523*	310,684	409,411	110,821	420,900	5,137

*Includes a $215,939 thousand obligation to FFRDCs administered by industrial firms and a $9,631 obligation to FFRDCs administered by non-profit institutions in other regions of the U.S.

Source: National Science Foundation, Federal Funds for Research & Development, Fiscal Years: 1986, 1987 and 1988.

#0218D

B. FEDERAL OBLIGATIONS TO COLLEGES AND UNIVERSITIES THROUGH 1986

Note: The charts included in this section reflect analyses of data provided by the National Science Foundation, indicative of the funds provided by 15 federal government agencies to institutions of higher education. This list includes five agencies that were excluded from the previous analysis of federal obligations to all organizations: the Agency for International Development (AID), the Department of Education (ED), the Department of Housing and Urban Development (HUD), the Department of Labor (LABOR) and the Nuclear Regulatory Commission (NRC). Obligations shown in this section do not include funds obligated to federally funded research and development centers (FFRDC's) administered by academic institutions. Totals included in these analyses exclude loans to individuals (such as federal guaranteed student loan programs administered by the Department of Education) and federal employee training and development activities. Tuition support programs such as Pell Grants and Supplemental Educational opportunities Grants are included in the figures. Indirect financial support (i.e. block grant funds allocated to state agencies that may be awarded to academic institutions) are excluded. The data reviewed in these analyses are gathered by a survey instrument that is different than that used for the collection of data reported in Section A, Federal Funds for Research and Development. Therefore, these two sections cannot be combined for comparison purposes.

#0222D

15. A Regional Comparison of Federal Obligations to Universities and Colleges: 1985 and 1986

1985

	Obligation in Thousands of $	% of Total	% of U.S. Pop+	Per Capita Obligation In Dollars	National Rank
New England	1,046,319	9.5	5.3	82.65	1
Middle Atlantic	1,740,033	15.9	15.6	46.78	4
East North Central	1,566,835	14.3	17.4	37.63	8
West North Central	755,728	6.9	7.4	43.05	6
South Atlantic	1,991,853	18.2	16.6	49.52	2
East South Central	577,575	5.3	6.3	38.19	7
West South Central	803,917	7.3	11.1	30.33	9
Mountain	583,560	5.3	5.4	45.63	5
Pacific	1,659,644	15.1	14.7	47.37	3
Outlying Areas	234,145	2.1			
U.S.	10,959,609	100.0	100.0	45.91	

1986

	Obligation in Thousands of $	% of Total Fed. R & D Obligation	% of U.S. Pop.+	Per Capita Obligation In Dollars	National Rank	1-Year Gain (in percent)
New England	1,078,646	9.3	5.3	84.69	1	3.1
Middle Atlantic	1,813,800	15.7	15.5	48.65	4	4.2
East North Central	1,645,901	14.2	17.3	39.44	8	5.0
West North Central	809,568	7.0	7.3	46.06	6	7.1
South Atlantic	2,096,135	18.1	17.0	51.23	2	5.2
East South Central	637,126	5.5	6.3	41.89	7	10.3
West South Central	859,511	7.4	11.1	31.99	9	6.9
Mountain	615,071	5.3	5.4	47.23	5	5.4
Pacific	1,754,292	15.1	14.8	49.09	3	5.7
Outlying Areas	274,037	2.4				17.0
U.S.	11,584,087	100.0		48.05		5.7

Note: Figures may not add up to 100 percent, due to rounding.

Sources: NEBHE Analysis (6/88) of data from the National Science Foundation, Federal Support to Universities, Colleges and Selected Non-Profit Institutions, Fiscal Year 1986 and U.S. Department of Commerce, Bureau of the Census, Statistical Abstract of the United States, 1987 and 1988.

#02220

16. Federal Obligations to Universities and Colleges: 1976 to 1986 in the New England States

(In thousands of dollars)

	1976	1978	1980	1982	1984	1985	1986
CT	84,959	115,839	141,798	158,321	181,372	206,314	196,993
MA	289,431	430,951	505,935	549,992	603,339	656,128	682,222
RI	29,896	37,776	52,618	62,682	62,053	66,828	73,428
ME	21,972	28,439	29,096	31,947	37,740	35,021	37,829
NH	21,925	29,910	35,946	37,575	36,771	41,392	44,557
VT	22,535	30,720	29,230	26,863	45,675	40,636	43,617
NE	470,718	673,635	794,623	867,380	966,950	1,046,319	1,078,646
US	5,402,764	7,471,843	8,298,118	8,776,258	10,118,460	10,959,609	11,584,087

Source: National Science Foundation, Federal Support to Universities and Colleges, (Fiscal Years 1983, 1985 and 1986)

#0222D

17. Federal Obligations to Universities and Colleges: 1986
To the New England States
1-Year, 2-Year, 4-Year, 6-Year, 8-Year and 10-Year Gain

(In percent)

	1985-1986 1-Year Gain	1984-1986 2-Year Gain	1982-1986 4-Year Gain	1980-1986 6-Year Gain	1978-1986 8-Year Gain	1976-1986 10-Year Gain
CT	-4.5	8.6	24.4	38.9	70.1	131.9
MA	4.0	13.1	24.0	34.8	58.3	135.7
RI	9.9	18.3	17.1	39.5	94.4	145.6
ME	8.0	.2	18.4	30.0	33.0	72.2
NH	7.6	21.2	18.6	24.0	49.0	103.2
VT	7.3	-4.5	62.4	49.2	42.0	93.6
NE	3.1	11.6	24.4	35.7	60.1	129.1
US	5.7	14.5	32.0	39.6	55.0	114.4

Source: NEBHE Analysis (6/88) of data from the National Science Foundation, Federal Support to Universities and Colleges, Fiscal Years 1983, 1985 and 1986

#0222D

18. A Regional Comparison of Federal Obligations to Universities and Colleges: 1986 of Research and Development as a Portion of Total Funds

(In thousands of dollars)

	Obligation for R&D	Total Obligation	R&D Obligation as % Of Total Obligation
New England	747,833	1,078,646	69.3
Mid. Atlantic	1,130,986	1,813,800	62.4
E. No. Central	873,904	1,645,901	53.1
W. No. Central	360,139	809,568	44.5
So. Atlantic	1,180,861	2,096,135	56.3
E. So. Central	219,146	637,126	34.4
W. So. Central	431,273	859,511	50.2
Mountain	366,578	615,071	59.6
Pacific	1,214,448	1,754,292	69.2
Outlying Areas	13,112	274,037	4.8
U.S.	6,538,280	11,584,087	56.4

Note: Obligations for R&D includes all research activities, basic and applied, and all development activities at universities and colleges as well as research equipment purchased. Conversely, total obligations include obligations for R & D and obligations for R & D plant, facilities/equipment for instruction in the sciences and engineering, funds for fellowships and traineeships and training grants, general support for science & engineering (S/E), other S/E activities, and non-S/E activities (support of the arts & humanities).

Source: NEBHE Analysis (6/88) of data from the National Science Foundation, Federal Support to Universities, Colleges and Selected Non-Profit Institutions: Fiscal Year 1986.

#0222D

19. Federal Obligations to Universities and Colleges: 1986
Percent Distribution by Region
of Each Agency's Funds

(In percent)

	Total	USDA	COM	DOD	ED	DOE	EPA	HHS	INT	NASA	NSF
Agency Total	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.
New England	9.3	4.0	16.4	9.8	6.1	19.7	10.5	11.3	5.2	8.7	12.9
Mid. Atlantic	15.7	7.4	8.2	13.3	13.5	15.5	12.5	19.4	12.1	7.5	21.0
E. No. Central	14.2	14.2	8.1	8.4	16.0	15.0	15.2	12.9	5.1	17.1	17.9
W. No. Central	7.0	13.3	2.5	1.7	9.0	3.0	5.4	6.8	16.0	4.0	3.9
So. Atlantic	18.1	18.6	22.1	36.2	18.4	11.6	17.9	15.3	9.7	12.9	10.4
E. So. Central	5.5	11.8	.8	1.3	8.2	5.8	2.9	4.3	3.2	5.3	1.1
W. So. Central	7.4	12.2	4.8	5.9	8.4	5.7	9.2	7.1	4.1	8.0	4.7
Mountain	5.3	6.7	10.2	8.3	4.7	4.0	14.3	4.0	27.8	10.7	5.5
Pacific	15.1	9.2	25.9	15.2	9.7	19.6	12.2	18.6	16.1	25.8	22.2
Outlying Areas	2.4	2.6	1.0	*	6.0	.1	*	.4	.7	*	.1

*Less than .05 percent

Source: NEBHE Analysis (6/88) of data from the National Science Foundation, Federal Support to Universities, Colleges and Selected Non-Profit Institutions, Fiscal Year 1986.

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20. Federal Obligations to Universities and Colleges: 1986
Percent Distribution by Agency
in Each New England State

(In percent)

	Total %	USDA	COM	DOD	ED	DOE	EPA	HHS	INT	NASA	NSF	*Other
CT	100.	1.8	1.0	3.9	16.2	4.2	.2	65.4	.1	.5	6.7	0.0
MA	100.	1.0	.6	14.1	19.4	9.6	.7	36.5	.2	2.5	14.9	.5
RI	100.	3.6	3.4	12.6	28.6	10.5	1.4	17.3	.4	2.2	20.1	0.0
ME	100.	11.8	.4	.5	75.5	.7	1.9	4.2	1.0	.2	3.8	0.0
NH	100.	7.5	6.4	6.2	23.3	1.8	.5	36.1	.3	8.6	9.3	.1
VT	100.	8.5	0.	1.2	44.0	.4	.4	42.5	.3	.1	2.6	0.0
N.E.	100.	2.3	1.1	10.8	22.5	7.7	.7	39.6	.3	2.3	9.1	.6
U.S.	100.	5.3	.6	10.3	34.5	3.6	.6	32.6	.4	2.2	12.6	.3

*Includes DOT, AID, HUD, LABOR and NRC.

Source: NEBHE Analysis (6/88) of data from the National Science Foundation, Federal Support to Universities, Colleges and Selected Non-Profit Institutions, Fiscal Year 1986.

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21. Total Federal Obligations to New England Universities and Colleges Listed Among the 100 Receiving the Largest Amounts: 1985 and 1986

(In thousands of dollars)

Institution	1986 Total Oblig.	1986 Rank	1985 Total Oblig.	1985 Rank
Massachusetts Institute of Technology, MA	212,360	2	213,214*	2
Harvard University, MA	133,226	13	131,790	13
Yale University, CT	129,700	14	133,756	11
Boston University, MA	66,327	39	59,387	44
University of Mass. at Amherst, MA	43,338	66	41,249	66
University of Connecticut, CT	43,285	67	42,941	64
Brown University, RI	39,719	72	31,178	88
Woods Hole Oceanographic Institute, MA	37,318	78	33,814	84
Tufts University, MA	31,226	92	28,673*	92
Univ. of Vermont & State Agric. Coll., VT	29,994	94		

Total to N.E. Institutions among top 100, 1985:	716,002	(10.1% of top 100; 6.5% of Grand Total)
Total to N.E. Institutions among top 100, 1986:	766,493	(10.5% of top 100; 6.6% of Grand Total)
Total to Top 100 Institutions, 1985:	7,114,228*	(64.9% of Grand Total)
Total to Top 100 Institutions, 1986:	7,323,191	(63.2% of Grand Total)
Total to All Institutions, 1985:	10,959,609*	
Total to All Institutions, 1986:	11,584,087	

*1985 figures were corrected in the 1986 National Science Foundation publication.

Source: NEBHE Analysis (10/86 & 6/88) of data from the National Science Foundation, Federal Support to Universities, Colleges and Selected Non-Profit Institutions, Fiscal Years 1985 and 1986.

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22. Federal Obligations to Universities and Colleges in New England: 1986
Ranking of Institutions in New England Receiving $1 Million or More

(In thousands of dollars)

Institution	All Agencies' Obligation
Massachusetts Institute of Technology, MA	212,360
Harvard University, MA	133,226
Yale University, CT	129,700
Boston University, MA	66,327
University of Massachusetts at Amherst,MA	43,338
University of Connecticut, CT	43,285
Brown University, RI	39,719
Woods Hole Oceanographic Institution, MA	37,318
Tufts University, MA	31,226
University of Vermont & State Agric. College, VT	29,994
Dartmouth College, NH	22,916
University of Massachusetts Medical School, MA	21,565
Northeastern University, MA	20,244
University of Rhode Island, RI	19,974
Brandeis University, MA	17,277
University of Maine, Orono, ME	15,816
University of New Hampshire, NH	10,462
Boston College, MA	9,561
University of Massachusetts at Boston, MA	5,963
University of Southern Maine, ME	5,886
University of Lowell, MA	5,299
Rhode Island College, RI	3,985
Wesleyan College, CT	3,739
Clark University, MA	3,588
Wentworth Institute of Technology, MA	3,106
Southeastern Massachusetts University, MA	3,085
University System of New Hampshire, NH	3,059
Johnson & Wales College, RI	2,601
Salem State College	2,369
Bunker Hill Community College, MA	2,296
Bridgewater State College, MA	2,157
University of Maine at Augusta, ME	2,121
Worcester Polytechnic Institute, MA	2,096
Wellesley College, MA	2,073
Simmons College, MA	2,029
Emmanuel College, MA	1,996
Community College Rhode Island, RI	1,969
Southern Connecticut State University, CT	1,911
University of Maine at Farmington, ME	1,905
University of Maine at Presque Isle, ME	1,862
Roxbury Community College, MA	1,860
Smith College, MA	1,842

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Institution	All Agencies' Obligation
Johnson State College, VT	1,836
Westfield State College, MA	1,832
Massasoit Community College, MA	1,827
Plymouth State College, Univ. NH, NH	1,752
Providence College, RI	1,719
Holyoke College, MA	1,602
University of Bridgeport, CT	1,591
Bristol Community College, MA	1,567
University of Hartford, CT	1,553
Mount Holyoke, MA	1,546
Amherst College, MA	1,510
Fisher Junior College, MA	1,469
Norwich University, VT	1,468
Quinsigamond Community College, MA	1,459
Central Connecticut State College, CT	1,458
Trinity College, CT	1,443
Worcester State College, MA	1,426
Bentley College, MA	1,364
North Shore Community College, MA	1,322
Suffolk University, MA	1,316
University of New Haven, CT	1,316
Castleton State College, VT	1,283
Radcliffe College, MA	1,276
Fitchburg State College, MA	1,260
College of the Holy Cross, MA	1,251
Newbury Junior College, MA	1,246
Bryant College of Business Administration, RI	1,224
Trinity College, CT	1,220
Assumption College, MA	1,192
Husson College, ME	1,187
Champlain College, VT	1,186
Emerson College, MA	1,170
New Hampshire College, NH	1,169
North Adams State College, MA	1,161
Eastern Connecticut State College, CT	1,111
Mt. Wachusetts Community College, MA	1,033
Bowdoin College, ME	1,022
Western New England College, MA	1,020
Total Obligation to Colleges & Universities Receiving $1 Million or More	1,025,492

(95.1% of the obligation to New England col./univ.; 8.9% of obligation to U.S. col./univ.)

Source: NEBHE Analysis (6/88) of data from the National Science Foundation, Federal Support to Universities, Colleges and Selected Non-Profit Institutions, Fiscal Year 1986.

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23. U.S. Department of Agriculture Obligations (USDA): 1986
to Universities and Colleges in New England
Ranking of Institutions in New England Receiving $1 Million or More

(In thousands of dollars)

College/University	USDA Obligation	
University of Massachusetts at Amherst, MA	6,094	
University of Maine, Orono, ME	4,377	
University of Vermont & State Agric. Coll., VT	3,708	
University of Connecticut, CT	3,588	
University of New Hampshire, NH	3,154	
University of Rhode Island, RI	2,585	
Total USDA Obligation to Institutions Receiving $1 Million or more	23,506	(95.5% of the USDA obligation to New England col./univ.; 3.8% of USDA obligation to U.S. col./univ.)

Source: NEBHE Analysis (6/88) of data from the National Science Foundation, Federal Support to Universities, Colleges and Selected Nonprofit Institutions, Fiscal Year 1986.

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24. U.S. Department of Commerce (COM) Obligations: 1986
to Universities and Colleges in New England
Ranking of Institutions in New England Receiving $1 Million or More

(In thousands of dollars)

College/University	COM Obligation	
University System of New Hampshire, NH	2,859	
Massachusetts Institute of Technology	2,378	
University of Rhode Island, RI	2,176	
University of Connecticut, CT	2,006	
Total COM Obligation to Institutions Receiving $1 Million or more	9,419	(82.0% of the COM obligation to New England col./univ.; 13.4% of COM obligation to U.S. col./univ.)

Source: NEBHE Analysis (6/88) of data from the National Science Foundation, Federal Support to Universities, Colleges and Selected Nonprofit Institutions: Fiscal Year 1986.

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25. U.S. Department of Defense Obligations (DOD): 1986
to Universities and Colleges in New England
Ranking of Institutions in New England Receiving $1 Million or More

(In thousands of dollars)

Institution	DOD Obligation	
Massachusetts Institute of Technology, MA	46,945	
Woods Hole Oceanographic Institution, MA	15,825	
University of Massachusetts at Amherst, MA	8,707	
Harvard University, MA	8,323	
Brown University, RI	6,512	
Yale University, CT	6,085	
Boston University, MA	5,183	
University of Rhode Island, RI	2,762	
Northeastern University, MA	2,473	
Dartmouth College, NH	2,146	
University of Connecticut, CT	1,759	
University of Lowell, MA	1,639	
Wentworth Institute of Technology, MA	1,606	
Emmanuel College, MA	1,493	
Boston College, MA	1,402	
Total DOD Obligation to Institutions Receiving $1 million or more	112,860	(96.8% of the DOD obligation to New England col./univ.; 9.4% of DOD obligation to U.S. col./univ.)

Source: NEBHE Analysis (6/88) of data from the National Science Foundation, Federal Support to Universities, Colleges and Selected Nonprofit Institutions, Fiscal Year 1986.

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26. U.S. Department of Education (ED) Obligations: 1986
to Universities and Colleges in New England
Ranking of Institutions in New England Receiving $1 Million or More

(In thousands of dollars)

Institution	ED Obligation
Boston University, MA	13,861
University of Massachusetts at Amherst, MA	13,180
Northeastern University, MA	12,275
University of Maine, Orono, ME	8,335
Harvard University, MA	6,993
University of Connecticut, CT	6,041
University of Vermont and State Agric. College, VT	5,916
University of Southern Maine, ME	5,089
Boston College, MA	5,051
University of Massachusetts at Boston, MA	4,627
Massachusetts Institute of Technology, MA	4,624
University of Rhode Island, RI	4,322
Yale University, CT	4,161
Rhode Island College, RI	3,896
Brown University, RI	3,196
Southeastern Massachusetts University, MA	2,640
Johnson & Wales College, RI	2,601
Salem State College, MA	2,369
Bunker Hill Community College, MA	2,296
University of Lowell, MA	2,276
Tufts University, MA	2,187
Bridgewater State College, MA	2,157
Wesleyan University, CT	2,130
Dartmouth College, NH	2,129
University of Maine at Augusta, ME	2,111
University of Maine at Farmington, ME	1,905
Southern Connecticut State University, CT	1,884
University of Maine at Presque Isle, ME	1,862
Roxbury Community College, MA	1,860
Johnson State College, VT	1,836
Massasoit Community College, MA	1,827
Community College of Rhode Island	1,799
Westfield State College, MA	1,798
Plymouth State College, Univ. of NH, NH	1,744
Brandeis University, MA	1,719
Providence College, RI	1,707
Holyoke College, MA	1,602
University of Bridgeport, CT	1,591
Bristol Community College, MA	1,567
Simmons College, MA	1,565

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Institution	ED Obligation
University of Hartford, CT	1,538
Fisher Junior College, MA	1,469
Quinsigamond Community College, MA	1,459
Central Connecticut State College, CT	1,447
Trinity College, VT	1,443
Wentworth Institute of Technology, MA	1,429
Worcester State College, MA	1,426
Clark University, MA	1,395
Norwich University, VT	1,394
Smith College, MA	1,387
Bentley College, MA	1,364
North Shore Community College, MA	1,322
Suffolk University, MA	1,316
University of New Haven, CT	1,316
Castleton State College, VT	1,283
Fitchburg State College, MA	1,260
Newbury Junior College, MA	1,246
Bryant College of Business Administration, RI	1,224
Assumption College, MA	1,192
Husson College, ME	1,187
Champlain College, VT	1,186
Radcliffe College, MA	1,183
College of the Holy Cross, MA	1,180
Emerson College, MA	1,170
New Hampshire College, NH	1,165
North Adams State College, MA	1,161
Eastern Connecticut State College, CT	1,111
Mount Wachusetts Community College, MA	1,033
Total ED Obligation to Colleges & Universities Receiving $ Million or more	$187,015 (77.0% of the total ED obligation to New England col./univ.; 4.7% of ED obligation to U.S. col./univ.)

Source: NEBHE Analysis (6/88) of data from the National Science Foundation, Federal Support to Universities, Colleges and Selected Non-Profit Institutions, Fiscal Year 1986.

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27. U.S. Department of Energy Obligations (DOE): 1986
to Universities and Colleges in New England
Ranking of Institutions in New England Receiving $1 Million or More

(In thousands of dollars)

Institution	DOE Obligation	
Massachusetts Institute of Technology, MA	55,437	
Yale University, CT	7,720	
Brown University, RI	7,658	
Harvard University, MA	5,283	
University of Massachusetts at Amherst, MA	1,345	
Total DOE Obligation to Institutions Receiving $1 Million or more	77,443	(93.4% of the DOE obligation to New England col./univ.; 18.4% of DOE obligation to U.S. col./univ.)

Source: NEBHE Analysis (6/88) of data from the National Science Foundation, Federal Support to Universities, Colleges and Selected Nonprofit Institutions: Fiscal Year 1986.

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28. U.S. Environmental Protection Agency (EPA) Obligations: 1986
to Universities and Colleges in New England
Ranking of Institutions in New England Receiving $1 Million or More

(In thousands of dollars)

Institution	EPA Obligation	
Tufts University, MA	2,742	
University of Rhode Island, RI	1,001	
Total EPA Obligation to Institutions Receiving $1 Million or More	3,743	(50.5% of the EPA obligation to New England col./univ.; 5.3% of EPA obligation to U.S. col./univ.)

Source: NEBHE Analysis (6/88) of data from the National Science Foundation, Federal Support to Universities, Colleges and Selected Nonprofit Institutions: Fiscal Year 1986.

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29. U.S. Department of Health and Human Services Obligations (HHS): 1986
to Universities and Colleges in New England
Ranking of Institutions in New England Receiving $1 Million or More

(In thousands of dollars)

Institution	HHS Obligation	
Yale University, CT	100,820	
Harvard University, MA	90,695	
Massachusetts Institute of Technology, MA	49,616	
Boston University, MA	42,239	
University of Connecticut, CT	26,638	
Tufts University, MA	22,716	
University of Massachusetts Medical School, MA	19,934	
University of Vermont, VT	18,322	
Dartmouth College, NH	15,062	
Brown University, RI	11,030	
Brandeis University, MA	10,996	
University of Massachusetts at Amherst, MA	3,842	
Northeastern University, MA	2,454	
Boston College, MA	1,810	
University of Rhode Island, RI	1,447	
Wesleyan University, CT	1,032	
University of New Hampshire, NH	1,007	
Total HHS Obligation to Institutions Receiving $1 Million or more	419,660	(98.3% of the HHS obligation to New England col./univ.; 11.1% of HHS obligation to U.S. col./univ.)

Source: NEBHE Analysis (6/88) of data from the National Science Foundation, Federal Support to Universities, Colleges and Selected Nonprofit Institutions, Fiscal Year 1986.

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30. U.S. National Aeronautic and Space Administration (NASA) Obligations: 1986
to Universities and Colleges in New England
Ranking of Institutions in New England Receiving $1 Million or More

(In thousands of dollars)

Institution	NASA Obligation	
Massachusetts Institute of Technology, MA	12,528	
University of New Hampshire, NH	3,451	
Harvard University, MA	2,295	
Brown University, RI	1,406	
Total NASA Obligation to Institutions Receiving $1 Million or more	19,680	(83.7% of the NASA obligation to New England col./univ.; 7.3% of NASA obligation to U.S. col./univ.)

Source: NEBHE Analysis (6/88) of data from the National Science Foundation, Federal Support to Universities, Colleges and Selected Nonprofit Institutions, Fiscal Year 1986.

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31. U.S. National Science Foundation (NSF) Obligations: 1986
to Universities and Colleges in New England
Ranking of Institutions in New England Receiving $1 Million or More

(In thousands of dollars)

College/University	NSF Obligation	
Massachusetts Institute of Technology, MA	39,057	
Woods Hole Oceanographic Institution, MA	19,009	
Harvard University, MA	17,395	
Yale University, CT	10,093	
Brown University, RI	9,337	
University of Massachusetts at Amherst, MA	9,205	
University of Rhode Island, RI	5,362	
Boston University, MA	3,570	
Brandeis University, MA	2,937	
Northeastern University, MA	2,854	
Dartmouth College, NH	2,370	
University of Connecticut, CT	2,182	
University of New Hampshire, NH	1,713	
Tufts University, MA	1,545	
University of Maine, Orono, ME	1,188	
University of Vermont, VT	1,041	
Total NSF Obligation to Institutions Receiving $1 Million or more	128,858	(94.5% of the NSF obligation to New England col./univ.; 12.2% of NSF obligation to U.S. col./univ.)

Source: NEBHE Analysis (6/88) of data from the National Science Foundation, Federal Support to Universities, Colleges and Selected Nonprofit Institutions, Fiscal Year 1986.

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C. R & D EXPENDITURES AT DOCTORATE-GRANTING COLLEGES AND UNIVERSITIES THROUGH 1986

Note: The charts included in this section reflect analyses of data provided by the National Science Foundation, indicative of expenditures of funds received by doctorate-granting institutions from the federal government, state and local government, industry, internal institutional funds and other sources. Doctorate-granting institutions comprise greater than 98 percent of those institutions of higher education reporting R & D expenditures. Data were reported by universities and colleges to the NSF.

32. R & D Expenditures at Doctorate-Granting Institutions: 1985 and 1986
A Regional Comparison

1985

	Expenditure in Thousands of Dollars	% of Total Expend. in U.S.	% of U.S. Population+	Per Capita Expenditures In Dollars	Nat'l Rank
New England	914,570	9.8	5.3	$72.24	1
Middle Atlantic	1,549,174	16.6	15.6	41.65	4
East No. Central	1,355,308	14.5	17.4	32.55	7
West No. Central	632,827	6.8	7.4	36.05	6
South Atlantic	1,501,814	16.1	16.8	37.33	5
East South Central	300,557	3.2	6.3	19.88	9
West South Central	842,519	9.0	11.1	31.78	8
Mountain	586,823	6.3	5.4	45.88	3
Pacific	1,637,760	17.5	14.7	46.74	2
Outlying Areas	30,504	.3			
Total in US	9,351,856	100.	100.	39.17	

1986

	Expenditure in Thousands of Dollars	% of Total Expend. in U.S.	% of U.S. Population*	Per Capita Expenditures In Dollars	Nat'l Rank
New England	993,504	9.4	5.3	$78.00	1
Middle Atlantic	1,769,079	16.7	15.5	47.45	4
East No. Central	1,511,113	14.3	17.3	36.21	7
West No. Central	721,525	6.8	7.3	41.05	6
South Atlantic	1,763,627	16.7	17.0	43.10	5
East South Central	361,014	3.4	6.3	23.74	9
West South Central	947,563	9.0	11.1	35.27	8
Mountain	659,050	6.2	5.4	50.61	2
Pacific	1,808,128	17.1	14.8	50.60	3
Outlying Areas	36,035	.3			
Total in U.S.	10,570,638	100.	100.	43.85	

*Calculations based upon 1985 resident population as reported in the Statistical Abstract of the United States, 1987.

+Calculations based upon 1986 resident population as reported in the Statistical Abstract of the United States, 1988.

Source: NEBHE Analysis (11/86 and 5/88) of data from the National Science Foundation, Academic Science/Engineering: R&D Funds, Fiscal Years 1985 and 1986.

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33. R & D Expenditures at Doctorate-Granting Institutions: 1977 to 1986
To the New England States

(In thousands of dollars)

	1977+	1981	1985*	1986
CT	79,348	139,314	188,647	195,173
MA	265,490	435,671	583,466*	643,010
RI	21,543	41,240	56,597	64,136
ME	9,937	17,342	20,621	19,315
NH	13,705	27,451	38,043	42,171
VT	13,130	18,428	27,606	29,699
NE	403,153	679,446	914,980*	993,504
US	4,065,062	6,695,996	9,351,822	10,570,638

+Calculations were for all universities and colleges rather than for doctorate degree granting institutions. Regional data was not available for doctorate degree granting institutions in 1977, however, during the subsequent years in which data were available for both doctorate degree granting as well as all universities and colleges, greater than 98. percent of all R & D expenditures occurred at doctorate granting institutions.

*Figures were corrected and updated in the Fiscal Year 1986 publication.

Source: The National Science Foundation, Academic Science/Engineering: R & D Funds, Fiscal Years 1981,1985, and 1986.

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34. R & D Expenditures at Doctorate-Granting Institutions: 1977 to 1986
in the New England States
1-Year, 5-Year and 9-Year Gain

(In percent)

	1985-1986 1-Year Gain	1981-1986 5-Year Gain	1977-1986 8-Year Gain
CT	3.5	40.1	146.0
MA	10.2	47.6	142.2
RI	13.3	55.5	197.7
ME	-6.3	11.4	94.4
NH	10.9	53.6	207.7
VT	7.6	61.2	126.2
NE	8.6	46.2	146.4
US	13.0	57.9	160.0

Source: NEBHE analysis (5/88) of data from the National Science Foundation, Academic Science/Engineering: R & D Funds, Fiscal Years 1981, 1985 and 1986.

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35. R & D Expenditures at Doctorate-Granting Institutions: 1981, 1985 and 1986
Total Expenditure and National Rank*
The New England States

(In thousands of dollars)

	1981		1985		1986	
	Total Expenditure	National Rank*	Total Expenditure	National Rank*	Total Expenditure	National Rank*
CT	139,314	15	188,647	15	195,173	16
MA	435,671	3	583,056	4	643,010	4
RI	41,240	37	56,597	35	64,136	36
ME	17,342	47	20,621	47	19,315	48
NH	27,451	40	38,043	39	42,171	39
VT	18,428	45	27,606	43	29,699	42
NE	679,446		914,570		993,504	
US	6,695,996		9,351,856		10,570,638	
NE as % of Total in the U.S.	10.1%		9.8%		9.4%	

*Rank based on total expenditures in the 50 states and the District of Columbia.

Source: NEBHE Analysis (11/86 and 6/88) of data from the National Science Foundation, Academic Science/Engineering R & D Funds, 1981, 1985 and 1986 Fiscal Years.

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36. R & D Expenditures at Doctorate - Granting Institutions: 1981, 1985 and 1986
Percent Distribution by Source of Fund
in Each New England State

	Total %	Federal Government	1981+ State & Local Government	Industry	Institutional Funds	All Other Sources
CT	100.	77.9	2.4	1.3	13.8	4.5
MA	100.	79.6	1.4	5.4	4.0	9.6
RI	100.	88.5	6.4	4.1	.8	.2
ME	100.	43.3	17.0	6.6	29.7	3.4
NH	100.	70.1	4.5	.9	16.5	7.9
VT	100.	71.5	6.2	5.4	13.8	3.2
NE	100.	78.3	2.5	4.4	7.2	7.6
US	100.	67.0	7.9	4.2	14.3	6.6

	Total %	Federal Government	1985 State & Local Government	Industry	Institutional Funds	All Other Sources
CT	100	70.1	1.9	3.3	14.7	9.9
MA	100	76.6	.8	8.5	4.7	9.4
RI	100	76.4	1.5	6.0	9.3	6.9
ME	100	51.7	6.0	7.6	23.1	11.7
NH	100	68.9	7.0	5.4	16.7	2.1
VT	100	68.7	5.7	9.5	12.6	3.6
NE	100	74.2	1.6	7.2	8.2	8.9
US	100	63.1	7.0	5.7	16.9	7.4

	Total %	Federal Government	1986 State & Local Government	Industry	Institutional Funds	All Other Sources
CT	100.	65.8	2.2	3.0	21.0	8.0
MA	100.	75.4	1.8	8.5	4.9	9.4
RI	100.	75.1	1.5	6.7	9.7	7.1
ME	100.	44.4	4.1	14.8	26.3	10.4
NH	100.	70.1	7.6	3.4	11.6	7.3
VT	100.	66.8	6.5	11.2	11.4	4.1
NE	100.	72.4	2.3	7.3	9.3	8.7
US	100.	61.8	8.4	6.2	16.6	6.9

Note: Figures may not add up to 100 percent due to rounding

+A breakdown of expenditures by source of funds for doctorate-granting institutions was not available for 1981, therefore, the breakdown by all universities and colleges was used for the 1981 analysis. Approximately 98.6% and 98.3% of the total university/college research and development expenditures reported occurred at doctorate-granting institutions of the United States and New England respectively.

Source: NEBHE Analysis (10/86 and 6/88) of data from the National Science Foundation, Academic Science/Engineering: R & D Funds, Fiscal Years 1981, 1985 and 1986.

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37. R&D Expenditures at Doctorate Granting Institutions in the New England States
State/Local and Federal Governments as Sources: 1986

(In thousands of dollars)

	Total State Dollars	State/Local Dollars Per Capita	Total Federal Dollars	Federal Dollars Per Capita
Connecticut	4,351	1.36	128,501	40.30
Maine	796	.68	8,584	7.31
Massachusetts	11,286	1.94	484,638	83.10
New Hampshire	3,188	3.10	29,544	28.77
Rhode Island	939	.96	48,153	49.39
Vermont	1,929	3.57	19,848	36.69
Mew England	22,489	1.77	719,268	56.47
California	23,921	.88	971,393	36.00
Louisiana	32,251	7.17	47,396	10.53
Maryland	36,095	8.09	491,551	110.14
Texas	85,124	5.10	368,566	22.09
U.S.	883,209	3.67	6,512,462	27.08

Source: NEBHE analysis (4/88) of data from: the National Science Foundation, Academic Science/Engineering: R&D Funds, Fiscal Year, 1986; and U.S. Dept. of Commerce Bureau of Census, State Government Finance in 1986 (GF86-No.3) Oct., 1987.

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38. R & D Expenditures at Doctorate-Granting Institutions: 1981, 1985 and 1986
Percent Distribution by Source of Fund
to Each U.S. Region

1981

	Total %	Federal Government	State & Local Government	Industry	Institutional Funds	All Other Sources
New England	100.	78.3	2.5	4.4	7.2	7.6
Middle Atlantic	100.	69.6	3.9	4.8	13.1	8.6
East No. Central	100.	64.3	8.2	4.3	16.4	6.8
West No. Central	100.	55.2	13.2	3.3	22.6	5.7
South Atlantic	100.	70.2	7.3	3.8	14.3	4.3
East So. Central	100.	57.2	19.0	5.3	14.0	4.4
West So. Central	100.	52.4	14.6	5.4	19.7	8.0
Mountain	100.	66.6	10.5	6.9	10.4	5.5
Pacific	100.	71.6	6.2	2.5	13.1	6.4
Outlying Areas	100.	48.6	25.0	*	26.1	.3
U.S. Total	100.	67.0	7.9	4.2	14.3	6.6

1985

	Total %	Federal Government	State & Local Government	Industry	Institutional Funds	All Other Sources
New England	100.	74.2	1.6	7.2	8.2	8.9
Middle Atlantic	100.	65.7	4.6	6.5	13.5	9.8
East No. Central	100.	59.9	8.5	5.6	19.5	6.4
West No. Central	100.	49.1	14.1	5.6	24.5	6.9
South Atlantic	100.	65.8	6.1	6.1	17.8	4.1
East So. Central	100.	51.5	18.1	8.2	17.3	4.9
West So. Central	100.	48.7	13.0	6.1	22.2	9.9
Mountain	100.	61.9	8.2	8.1	16.9	4.8
Pacific	100.	70.1	3.2	2.2	15.8	8.6
Outlying Areas	100.	46.5	27.3	.2	25.5	.5
U.S. Total	100.	63.1	7.0	5.7	16.9	7.4

1986

	Total %	Federal Government	State & Local Government	Industry	Institutional Funds	All Other Sources
New England	100.	72.4	2.3	7.3	9.3	8.7
Middle Atlantic	100.	64.5	5.2	6.9	13.6	9.9
East No. Central	100.	58.9	9.2	5.6	19.3	7.0
West No. Central	100.	48.3	16.6	5.8	22.4	6.9
South Atlantic	100.	63.7	10.1	6.2	16.4	3.6
East So. Central	100.	49.7	19.6	9.0	17.3	4.4
West So. Central	100.	48.3	13.8	5.8	21.8	10.3
Mountain	100.	60.2	9.1	8.2	17.9	4.6
Pacific	100.	69.5	3.9	4.8	15.9	5.9
Outlying Areas	100.	47.1	27.0	.3	24.9	.7
U.S. Total	100.	61.8	8.4	6.2	16.6	6.9

Note: Figures may not add up to 100 percent due to rounding

*Percent is less than .05
+A breakdown of expenditures by source of funds for doctorate-granting institutions was not available for 1981, therefore, the breakdown by all universities and colleges was used for the 1981 analysis. Approximately 98.6% and 98.3% of the total university/college research and development expenditures occurred at doctorate-granting institutions of the United States and New England respectively.

Source: NEBHE Analysis (10/86) of data from the National Science Foundation, Academic Science/Engineering R & D Funds, Fiscal Years 1981, 1985 and 1986.

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39. R & D Expenditures at Doctorate-Granting Institutions: 1981, 1985 and 1986
Percent Distribution by State of Each Source's Funds

1981*

U.S. Source	Total %	Federal Government	State & Local Government	Industry	Institutional	All Other Sources	% of Tot.1981 U.S. Pop.
Total:	100.	100.	100.	100.	100.	100.	100.
CT	2.1	2.4	.6	.7	2.0	1.4	1.4
MA	6.6	7.8	1.1	8.5	1.8	9.6	2.5
RI	.6	.8	.5	.6	*	*	.4
ME	.3	.2	.6	.4	.5	.1	.5
NH	.4	.4	.2	.1	.5	.5	.4
VT	.3	.3	.2	.4	.3	.1	.2
NE	10.2	11.9	3.3	10.6	5.1	11.8	5.4

1985

U.S. Source	Total %	Federal Government	State & Local Government	Industry	Institutional	All Other Sources	% of Tot.1985 U.S. Pop.
Total:	100.	100.	100.	100.	100.	100.	100.
CT	2.0	2.2	.5	1.2	1.8	2.7	1.3
MA	6.2	7.6	.7	9.4	1.7	7.9	2.4
RI	.6	.7	.1	.6	.3	.6	.4
ME	.2	.2	.2	.3	.3	.3	.5
NH	.4	.4	.4	.4	.4	.1	.4
VT	.3	.3	.2	.5	.2	.1	.2
NE	9.8	11.5	2.2	12.4	4.7	11.8	5.3

1986

U.S. Source	Total %	Federal Government	State & Local Government	Industry	Institutional	All Other Sources	% of Tot.1986 U.S. Pop.
Total:	100.	100.	100.	100.	100.	100.	100.
CT	1.8	2.0	.5	.9	2.3	2.1	1.3
MA	6.1	7.4	1.3	8.4	1.8	8.2	2.4
RI	.6	.7	.1	.7	.4	.6	.4
ME	.2	.1	.1	.4	.3	.3	.5
NH	.4	.5	.4	.2	.3	.4	.4
VT	.3	.3	.2	.5	.2	.2	.2
NE	9.4	11.0	2.5	11.1	5.2	11.9	5.3

Note: Figures may not add up to 100 percent due to rounding

*A breakdown of expenditures by source of funds for doctorate-granting institutions was not available for 1981, therefore, the breakdown by all universities and colleges was used for the 1981 analysis. Approximately 98.6% and 98.3% of the total university/college research and development expenditures occurred at doctorate-granting institutions or the United States and New England respectively.

*Less than .05 percent

Source: NEBHE Analysis (10/86; 5/88) of data from the National Science Foundation, Academic Science/Engineering and Funds, Fiscal Years 1981, 1985 and 1986; and U.S. Department of Commerce Bureau of the Census, Statistical Abstract of the United States, 1983, 1987 and 1988.

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40. R & D Expenditures at Doctorate-Granting Institutions: 1981, 1985 and 1986
Percent Distribution by Region of Each Sources's Funds

1981+

Source	Total %	Federal Government	State & Local Government	Industry	Institutional	All Other Sources	% of Tot.1981 U.S. Pop.
Total:	100.	100.	100.	100.	100.	100.	100.
New England	10.2	11.9	3.3	10.6	5.1	11.8	5.4
Middle Atlantic	16.0	16.6	7.9	18.4	14.6	20.8	16.1
East No. Central	14.8	14.2	15.2	15.2	17.0	15.2	18.2
West No. Central	7.2	5.9	12.0	5.6	11.3	6.2	7.5
South Atlantic	15.3	16.1	14.1	14.0	15.3	10.1	16.5
East So. Central	3.4	2.9	8.1	4.3	3.3	2.3	6.4
West So. Central	8.6	6.7	15.9	11.0	11.8	10.4	10.7
Mountain	6.4	6.4	8.5	10.6	4.6	5.4	5.1
Pacific	17.8	19.1	13.9	10.4	16.3	17.8	14.2
Outlying Areas	.4	.3	1.1	*	.7	*	

1985

Source	Total %	Federal Government	State & Local Government	Industry	Institutional	All Other Sources	% of Tot.1985 U.S. Pop.
Total:	100.	100.	100.	100.	100.	100.	100.
New England	9.8	11.5	2.2	12.4	4.7	11.8	5.3
Middle Atlantic	16.6	17.2	10.8	18.9	13.3	21.8	15.6
East No. Central	14.5	13.8	17.6	14.5	16.8	12.4	17.4
West No. Central	6.8	5.3	13.6	6.6	9.8	6.3	7.4
South Atlantic	16.1	16.8	14.0	17.3	17.0	9.0	16.8
East So. Central	3.2	2.6	8.3	4.7	3.3	2.1	6.3
West So. Central	9.0	6.9	16.7	9.8	11.9	12.1	11.1
Mountain	6.3	6.2	7.4	9.0	6.3	4.1	5.4
Pacific	17.5	19.5	8.0	6.8	16.4	20.4	14.7
Outlying Areas	.3	.2	1.3	*	.5	*	

1986

Source	Total %	Federal Government	State & Local Government	Industry	Institutional	All Other Sources	% of Tot.1986 U.S. Pop.
Total:	100.	100.	100.	100.	100.	100.	100.
New England	9.4	11.0	2.5	11.1	5.2	11.9	5.3
Middle Atlantic	16.7	17.5	10.4	18.5	13.6	24.0	15.5
East No. Central	14.3	13.6	15.5	12.9	16.6	14.4	17.3
West No. Central	6.8	5.3	13.4	6.4	9.2	6.9	7.3
South Atlantic	16.7	17.2	20.0	16.5	16.5	8.6	17.0
st So. Central	3.4	2.7	7.9	4.9	3.6	2.2	6.3
est So. Central	9.0	7.0	14.6	8.4	11.7	13.4	11.1
Mountain	6.2	6.1	6.7	8.2	6.7	4.2	5.4
Pacific	17.1	19.3	7.9	13.1	16.4	14.5	14.8
Outlying Areas	.3	.3	1.2	*	.5	*	

Note: Figures may not add up to 100 percent due to rounding

*Less than .05 percent

+ A breakdown of expenditures by source of funds for doctorate-granting institutions was not available for 1981, therefore, the breakdown by all universities and colleges was used for the 1981 analysis. Approximately 98.6% and 98.3% of the total university/college research and development expenditures occurred at doctorate-granting institutions or the United States and New England respectively.

Source: NEBHE Analysis (10/86; 6/88) of data from the National Science Foundation, Academic Science/Engineering and Funds, Fiscal Years 1981, 1985, 1986, and U.S. Department of Commerce Bureau of the Census, Statistical Abstract of the United States, 1983, 1986 & 1988.

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41. R&D Expenditures at Doctorate-Granting Institutions: 1986
Percent Distribution Within Each Academic Discipline
U.S. Regional Comparison

Source Total:	Total % 100.	Engineering 100.	Physical Science 100.	Environmental Science 100.	Math & Computer Science 100.	Life Science 100.	Psychology 100.	Social Science 100.	Other Sciences 100.	% of Tot.1986 U.S. Pop.
New England	9.4	10.6	13.3	12.4	8.3	7.9	10.3	10.1	7.7	5.3
Middle Atlantic	16.7	16.1	15.5	9.7	21.9	17.7	20.5	17.6	11.8	15.5
East No. Central	14.3	15.3	15.7	9.1	10.3	13.7	17.8	19.5	26.8	17.3
West No. Central	6.8	5.0	4.0	3.3	4.1	8.8	9.0	6.0	2.7	7.3
South Atlantic	16.7	22.3	15.7	16.9	28.4	14.5	14.1	17.3	12.4	17.0
East So. Central	3.4	2.9	1.5	.7	.7	4.7	2.7	2.7	2.5	6.3
West So. Central	9.0	7.3	6.9	11.4	5.2	9.7	3.6	8.4	17.4	11.1
Mountain	6.2	7.8	7.5	10.7	6.9	4.9	5.1	6.4	5.3	5.4
Pacific	17.1	12.8	19.7	25.7	13.8	17.5	16.9	11.5	13.4	14.8
Outlying Areas	.3	*	.2	*	.3	.5	*	.4	*	

Note: Figures may not add up to 100 percent due to rounding.

* Less than .05 percent

Source: NEBHE Analysis of data (6/88) from the National Science Foundation, Academic Science/Engineering: R&D Funds, Fiscal Year 1986; and U.S. Department of Commerce, Bureau of the Census, Statistical Abstract of the United States, 1988.

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42. R & D Expenditures at Doctorate-Granting Institutions: 1981, 1985 and 1986 Percent Distribution By Academic Discipline in Each New England State

1981+

	Total %	Engineering	Physical Science	Environmental Science	Math & Computer Science	Life Science	Psychology	Social Science	Other Sciences
CT	100.	6.4	10.0	1.3	2.0	71.6	4.0	4.7	*
MA	100.	19.9	20.3	11.5	3.7	36.3	2.0	4.8	1.6
RI	100.	17.3	9.1	43.1	4.8	20.8	1.6	3.2	*
ME	100.	10.2	7.3	17.5	.7	49.5	.1	10.4	4.3
NH	100.	10.1	11.8	10.1	.5	55.1	.8	1.4	10.3
VT	100.	1.6	5.4	.2	.5	87.7	.7	2.6	1.3
NE	100.	15.9	16.5	11.1	3.1	45.0	2.2	4.6	1.6
US	100.	14.1	11.2	8.1	3.2	53.9	1.9	5.4	2.1

1985

	Total %	Engineering	Physical Science	Environmental Science	Math & Computer Science	Life Science	Psychology	Social Science	Other Sciences
CT	100.	6.7	12.4	2.7	3.1	69.1	3.3	2.7	*
MA	100.	22.1	19.7	10.4	4.1	36.9	1.8	3.7	1.3
RI	100.	18.0	8.7	38.1	8.2	23.4	1.1	2.5	*
ME	100.	11.1	4.0	11.2	*	60.5	1.8	2.9	8.4
NH	100.	7.3	20.3	10.0	.7	55.6	.7	1.1	4.3
VT	100.	1.9	4.4	.2	.3	90.5	1.7	.2	.7
NE	100.	17.2	16.7	10.2	3.8	45.7	2.0	3.1	1.2
US	100.	14.5	11.9	7.3	4.3	54.4	1.7	3.9	1.9

1986

	Total %	Engineering	Physical Science	Environmental Science	Math & Computer Science	Life Science	Psychology	Social Science	Other Sciences
CT	100.	5.8	13.5	2.3	3.4	68.5	2.3	2.6	1.6
MA	100.	21.6	19.1	9.1	4.0	37.1	1.8	5.6	1.6
RI	100.	18.3	9.2	36.9	9.4	22.3	1.3	2.5	0.
ME	100.	8.1	6.1	7.2	.5	64.9	1.7	3.4	7.9
NH	100.	8.5	17.5	11.1	.6	55.3	.7	2.3	4.1
VT	100.	2.1	4.4	.2	.3	89.7	2.2	.2	.9
NE	100.	16.9	16.6	9.4	3.9	45.2	1.8	4.5	1.7
US	100.	15.0	11.7	7.1	4.4	53.9	1.7	4.2	2.1

Note: Figures may not add up to 100 percent due to rounding

+ A breakdown of expenditures by source of funds for doctorate-granting institutions was not available for 1981, therefore, the breakdown by all universities and colleges was used for the 1981 analysis. Approximately 98.6% and 98.3% of the total university/college research and development expenditures occurred at doctorate-granting institutions or the United States and New England respectively.

* Less than .05 percent.

Source: NEBHE Analysis (10/86 and 6/88) of data from the National Science Foundation, Academic Science/Engineering: R&D Funds, Fiscal Year 1981, 1985 and 1986.

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43. R & D Expenditures at Doctorate-Granting Institutions: 1981, 1985 and 1986
Percent Expenditures, from Non-Federal Sources
A Regional Comparison

Region	1981 Total all Sources (in thous.)	1981 % Non-Fed Funds	1985 Total All Sources (in thous.)	1985 % Non-Fed. Funds	1986 Total All Sources (in thous.)	1986 % non-fed. Funds	5-Year Gain 1981-1986 of Non-Fed. Funds (in percent)
New England	679,446	21.6	914,980*	25.9	993,504	27.6	87.0
Middle Atlant.	1,071,098	30.2	1,549,174	34.3	1,769,079	35.5	94.1
E.N. Central	996,812	35.6	1,355,308	40.1	1,511,113	41.1	75.1
W.N. Central	492,720	45.6	632,827	50.9	721,525	51.7	66.1
S. Atlantic	1,020,463	29.8	1,538,643*	35.4	1,763,627	36.3	110.6
E.S. Central	222,714	43.2	300,557	48.5	361,014	50.3	89.0
W.S. Central	569,577	48.0	842,519	51.3	947,563	51.7	79.3
Mountain	433,127	33.8	579,550*	38.3	659,050	39.8	78.9
Pacific	1,188,158	28.0	1,637,760	29.9	1,808,128	30.5	65.6
Out. Areas	21,881	51.9	30,504	53.5	36,035	52.9	67.8
U.S.	6,695,996	33.1	9,381,822*	37.1	10,570,638	38.2	82.6

*1985 figures were corrected in the 1986 NSF publication.

Source: NEBHE analysis of data (11/86 and 6/88) from the National Science Foundation, Academic Science/Engineering: R&D Funds, Fiscal Years 1985 and 1986.

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44. Total R & D Expenditures: 1985 and 1986 at New England Universities/Colleges Listed Among the 100 Spending the Largest Amount

(In thousands of dollars)

Institution	1986 Total Expenditure	1986 Rank	1985 Total Expenditure	1985 Rank
Massachusetts Institute of Technology, MA	257,726	2	242,966	2
Harvard University, MA	154,390	14	138,063*	14
Yale University, CT	115,879	22	107,245	21
University of Connecticut, CT	72,366	48	75,155	37
Boston University, MA	53,225	67	44,135	76
University of Massachusetts, Amherst, MA	46,434	78	37,719	82
Woods Hole Oceanographic Institute, MA	43,675	82	43,132	77
University of Rhode Island, RI	32,217	97	28,241	96
Brown University, RI	31,906	98	28,344	95
University of Vermont & St. Agric. Col., VT+			27,606+	100+

Total of N.E. Institutions among Top 100, 1985:	772,906	(9.8% of top 100; 8.1% of Grand Total)
Total of N.E. Institutions among Top 100, 1986:	807,818	(9.1% of top 100; 7.5% of Grand Total)
Total of Top 100 Institutions, 1985:	7,922,712	(83.2% of Grand Total)
Total of Top 100 Institutions, 1986:	8,895,699	
Grand Total of All Institutions in 1985:	9,524,293	(83.0% of Grand Total)
Grand Total of All Institutions in 1986:	10,718,402	

*1985 Figures were corrected in the 1986 NSF publication.

+In 1986 U. of VT & St. Agric. Col. was ranked 101, nationally, with $29,699 thousand.

Source: NEBHE analysis of data (11/86 & 6/88) from the National Science Foundation, Academic Science/Engineering: R & D Funds, Fiscal Years 1985 and 1986.

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45. Non-Federal R & D Expenditures: 1985 and 1986
at New England Universities and Colleges
Listed Among the 100 Spending the Largest Amount

(In thousands of dollars)

Institutions	1986 Total Expenditures	1986 Rank	1985 Total Expenditures	1985 Rank
Massachusetts Institute of Technology	56,629	16	53,031	14
University of Connecticut, CT	36,224	34	36,211	27
Harvard University, MA	42,887	28	34,507*	31
Yale University, CT	28,472	46	18,323	59
University of Massachusetts, Amherst, MA	21,307	59	16,381	69
University of Maine, Orono+			9,968+	100+

Total of N.E. Institutions Among Top 100, 1985:	168,421*	(5.8% of top 100; 4.8% of Grand Total)
Total of N.E. Institutions Among Top 100, 1986:	185,519	(5.5% of top 100; 4.5% of Grand Total)
Total of Top 100, 1985:	2,912,231*	(82.9% of Grand Total)
Total of Top 100, 1986:	3,363,426	(82.3% of Grand Total)
Grand Total of All Institutions, 1985:	3,526,520*	
Grand Total of All Institutions, 1986:	4,085,055	

*1985 figures were corrected in the 1986 NSF publication.

+In 1986 U. of Maine, Orono was ranked 106, nationally, with Non-Federal R&D Expenditures of $10,731 thousand.

Source: NEBHE analysis of data (11/86 & 6/88) from the National Science Foundation, Academic Science/Engineering: R & D Funds, Fiscal Years 1985 and 1986.

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46. Industry-Sponsored R & D Expenditures: 1985 and 1986
at New England Colleges and Universities
Listed Among the 100 Spending the Largest Amount

(In thousands of dollars)

Institutions	1986 Total Expenditures	1986 Rank	1985 Total Expenditures	1985 Rank
Massachusetts Institute of Technology, MA	34,764	1	32,007	1
Harvard University, MA	6,723+	26	5,410*	24
University of Connecticut, CT	4,090	48	4,572	30
University of Massachusetts, Amherst, MA	4,071	50	3,096	47
Brown University, RI	3,848	51	3,000	48
University of Vermont & State Agric. Coll., VT	3,331	62	2,613	60
Worcester Polytechnic Institute, MA	3,289+	65	2,966+	50
University of Maine, Orono, ME	2,856	75	1,559	95
Boston University, MA	2,076	98	1,994	81
Yale University, CT[a]			1,729	90

Total of N.E. Institutions Among Top 100 in 1985:	58,946	(13.4% of top 100; 10.9% of Grand Total)
Total of N.E. Institutions Among Top 100 in 1986:	65,048	(11.5% of top 100; 9.7% of Grand Total)
Total of Top 100 Institutions in 1985:	441,162	(81.3% of Grand Total)
Total of Top 100 Institutions in 1986:	563,716	(84.5% of Grant Total)
Grand Total of All Institutions in 1985:	542,849	
Grand Total of All Institutions in 1986:	667,362	

*Estimated data or includes estimated data
+Inputted data
[a]In 1986, Yale University was ranked 105 nationally, with Industry-Sponsored R & D expenditures of $1,790 thousand.

Source: The National Science Foundation, Academic Science/Engineering: R & D Funds, Fiscal Years 1985 and 1986.

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47. R & D Expenditures: 1985 and 1986
at Public Colleges & Universities in New England
Listed Among the Top 100 Spending the Largest Amount

(In thousands of dollars)

Institutions	1986 Total Expenditures	1986 Rank	1985 Total Expenditures	1985 Rank
University of Connecticut, CT	72,366	32	75,155	24
University of Massachusetts, Amherst, MA	46,434	53	37,719	56
University of Rhode Island, RI	32,217+	68	28,241	67
University of Vermont & State Agric. Coll., VT	29,699	71	27,606	69
University of Maine, Orono, ME	19,315	86	21,621	78
University of New Hampshire	18,263	92	18,772	83
Univ. of Massachusetts Med. School, Worcester, MA	14,682+	100	12,870+	99

Total of N.E. Institutions Among Top 100 in 1985: 220,984 (3.9% of top 100; 3.6% of Grand Total)
Total of N.E. Institutions Among Top 100 in 1986: 232,976 (3.7% of top 100; 3.4% of Grand Total)

Total of Top 100 Institutions in 1985: 5,614,436 (91.8% of Grand Total)
Total of Top 100 Institutions in 1986: 6,359,555 (91.6% of Grand Total)

Grand Total of All Institutions in 1985: 6,119,037
Grand Total of All Institutions in 1986: 6,944,539

+Inputed data

Source: The National Science Foundation, Academic Science/Engineering: R&D Funds, Fiscal Year 1985 and 1986.

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48. R & D Expenditures: 1985 and 1986 at Independent Colleges & Universities in New England Listed Among the 100 Spending the Largest Amount

(In thousands of dollars)

Institutions	1986 Total Expenditures	1986 Rank	1985 Total Expenditures	1985 Rank
Massachusetts Institute of Technology, MA	257,766	2	242,966	2
Harvard University, MA	154,290	5	137,653*	5
Yale University, CT	115,879	8	107,245	8
Boston University, MA	53,225	23	44,135	24
Woods Hole Oceanographic Institute, MA	43,675	26	43,132	25
Brown University, RI	31,906	30	29,344	29
Dartmouth College, NH	23,908	34	19,271	35
Brandeis, MA	20,185+	37	18,201	37
Tufts University, MA	18,611+	39	16,782+	40
Northeastern University, MA	9,243	55	2,883	51
Wesleyan University, CT	6,928+	59	6,247+	58
Worcester Polytechnic Institute, MA	5,542	63	4,997+	62
Boston College, MA	5,272	65	5,272	65
Clark University, MA	3,445+	73	3,106+	73
Smith College, MA	1,692+	84	1,526+	83
Wellesley College, MA	924+	99	914	100

Total of N.E. Institutions Among Top 100 in 1985: 688,156 (20.6% of top 100, 20.3% of Grand Total)
Total of N.E. Institutions Among Top 100 in 1986: 752,551 (20.2% of top 100, 19.9% of Grand Total)

Total of Top 100 Institutions in 1985: 3,346,581 (98.9% of Grand Total)
Total of Top 100 Institutions in 1986: 3,731,579 (98.9% of Grand Total)

Grand Total in 1985: 3,384,689
Grand Total in 1986: 3,773,863

+Inputed data
*Estimated data or includes estimated data

Source: NEBHE analysis of data (11/86) from the National Science Foundation, Academic Science/Engineering: R & D Funds, Fiscal Years 1985 and 1986.

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49. Research Expenditures per Faculty Member: 1984 and 1985
In All Institutions of Higher Education and National Ranking
the Six New England States

Public Institutions

	1984		1985	
	$ Expenditures	National Rank	$ Expenditures	National Rank
Connecticut	14,210	39	17,388	23
Massachusetts	6,878	38	6,057	50
Rhode Island	16,580	30	14,976	31
Maine	13,375	41	12,582	71
New Hampshire	20,250	20	18,948	17
Vermont	23,688	10	25,724	7
U.S. Average:	18,304		17,679	

Independent Institutions

	1984		1985	
	$ Expenditures	National Rank	$ Expenditures	National Rank
Connecticut	31,016	4	32,571	4
Massachusetts	51,390	3	44,573	3
Rhode Island	19,012	18	20,647	9
Maine	961	31	1,070	5
New Hampshire	18,346	19	22,031	7
Vermont	647	33	373	34
U.S. Average:	24,294		20,625	

Source: NCHEMS, Higher Education Financing in the Fifty States: Interstate Comparisons, Fiscal Year 1984, 5th edition and OERI, U.S. Dept. of Ed., State Higher Education Profiles; 1985.

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50. Research Expenditures per Faculty Member: 1985
in Institutions of Higher Education, 4-Years and Above
and National Ranking
of the Six New England States

	Public Institutions		Independent Institutions	
	$ Expenditures	National Rank	$ Expenditures	National Rank
Connecticut	22,529	24	32,928	4
Massachusetts	8,730	49	46,914	3
Rhode Island	18,927	34	21,462	8
Maine	15,647	41	1,089	29
New Hampshire	24,491	22	22,493	7
Vermont	27,570	17	409	34
U.S. Average:	24,785		21,268	

Source: OERI, U.S. Dept. of Ed., State Higher Education Profiles; 1985.

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D. BIOMEDICAL R & D: NATIONAL INSTITUTES OF HEALTH FUNDING AWARDS THROUGH 1987

Note: The charts included in this section reflect analyses of data provided by the National Institutes of Health (NIH). They review NIH biomedical funding to all domestic organizations and institutions of higher education, medical schools and independent hospitals. Several of the charts reflect data published annually in the NIH Data Book while others reflect data prepared for internal working documents that are provided to the Department of Health and Human Services (HHS) for preparation of their own departmental reports as well as for those figures that are then reported to the National Science Foundation.

Note #2: The history of New England's medical profession reveals that teaching hospitals were established prior to its university medical schools. The region therefore has a substantial number of teaching hospitals that independently secure relatively large sums of funding.

*Indicates teaching hospitals in New England. Of the 32 independent hospitals of New England that receive NIH Funds in 1987, 23 (or 71.9%) are teaching hospitals. Further, of the NIH Funds that are awarded to New England hospitals, 97.8% (representing 218,721.2 thousand dollars) is awarded to teaching hospitals. This figure represents 53.3% of all funds awarded to teaching hospitals nationally.

Source: NEBHE Analysis (12/86 and 7/88) of Summary of NIH Extramural Awards to Independent Hospitals, for Fiscal Years 1986 and 1987: 3/19/87 and 3/11/88.

#0224D

51. National Institutes of Health Funding Awards: 1986 and 1987
A Regional Comparison

1986

	Tot. of Awards Thousands of $	% of Total Dollars Awarded	% of U.S. Pop.	Per Capita Award In Dollars	Per Capita Award National Rank
New England	660,901	14.9	5.3	$51.89	1
Middle Atlantic	855,970	19.3	15.6	22.96	3
East North Central	509,326	11.5	17.4	12.20	6
West North Central	275,911	6.2	7.4	15.70	5
South Atlantic	682,973	15.4	16.8	16.69	4
East South Central	161,769	3.7	6.3	10.64	8
West South Central	262,347	5.9	11.1	9.77	9
Mountain	150,961	3.4	5.4	11.59	7
Pacific	831,491	18.8	14.7	23.27	2
U.S. Total	4,391,649		100.	18.22	
Outlying Areas	8,785	.2			
Foreign Areas	26,173	.6			
Total	4,426,607	100.			

1987

	Tot. of Awards Thousands of $	% of Total Dollars Awarded	% of U.S. Pop.	Per Capita Award In Dollars	Per Capita Award National Rank
New England	769,459	14.8	5.3	$59.91	1
Middle Atlantic	987,031	19.0	15.4	26.37	2
East North Central	609,391	11.7	17.2	14.54	6
West North Central	326,248	6.3	7.2	18.50	5
South Atlantic	826,331	15.9	17.1	19.82	4
East South Central	195,971	3.8	6.3	12.82	8
West South Central	306,397	5.9	11.1	11.39	9
Mountain	170,715	3.3	5.4	12.97	7
Pacific	960,881	18.5	15.0	26.30	3
U.S. Total	5,160,360		100.	21.20	
Outlying Areas	8,935	.2			
Foreign Areas	32,803	.6			
Total	5,194,164	100.			

Sources: NEBHE Analysis (7/88) of early release NIH data to be published in the NIH DATA Book, 1987 and 1988 editions, and U.S. Department of Commerce, Bureau of the Census, Population Estimates, 1986 and 1987.

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52. National Institutes of Health Funding Awards: 1979 to 1987
To the New England States

(In thousands of dollars)

	1979	1981	1983	1985	1986	1987
CT	66,466	79,143	92,427	117,052	121,763	139,844
MA	243,996	291,229	335,352	456,533	473,137	554,986
RI	8,482	12,314	14,199	19,577	21,352	24,988
ME	5,217	5,704	7,596	9,075	9,495	10,979
NH	6,788	8,406	8,720	13,467	16,219	16,855
VT	8,700	9,492	11,863	16,394	18,935	21,807
N.E.	339,649	406,288	470,157	632,098	660,901	769,459
*U.S.	2,592,641	2,883,673	3,246,415	4,248,136	4,426,607	5,194,164

*Includes Awards to Outlying and Foreign Areas

Source: NIH Data Books, 1980, 1982, 1984, 1986 and early release data for the 1987 and 1988 editions of the NIH Data Book.

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53. National Institutes of Health Funding Awards: 1987
To the New England States
1-Year, 2-Year, 4-Year, 6-Year, and 8-Year Gain

(In percent)

	1986-1987 1-Year Gain	1985-1987 2-Year Gain	1983-1987 4-Year Gain	1981-1987 6-Year Gain	1979-1987 8-Year Gain
CT	14.8	19.5	51.3	76.7	110.4
MA	17.3	21.6	65.5	90.6	127.5
RI	17.0	27.6	76.0	135.7	194.6
ME	15.6	21.0	44.5	92.5	110.4
NH	3.9	25.2	93.3	100.5	148.3
VT	15.2	33.0	83.8	149.4	150.7
N.E.	16.4	21.7	63.7	90.5	126.5
U.S.	17.3	22.3	60.0	80.1	100.3

Source: NEBHE Analysis of data (7/88) from the NIH Data Books, 1980, 1982, 1984, 1986 and early release data for the 1987 and 1988 editions of the NIH Data Book.

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54. NIH Total Grants and Awards: 1979 to 1987
The New England States
Awards As Proportion of Total

(In percent)

	1979		1981		1983		1985		1986		1987	
	% of Tot. To Region	% of Tot. To U.S.	% of Tot. To Region	% of Tot. To U.S.	% of Tot. To Region	% of Tot. To U.S.	% of Tot. To Region	% of Tot. To U.S.	% of Tot. To Region	% of Tot. To U.S.	% of Tot. To Region	% of Tot. To U.S.
CT	19.6	2.6	19.6	2.7	19.7	2.8	18.5	2.8	18.4	2.8	18.2	2.7
MA	71.8	9.4	72.1	10.1	71.3	10.3	72.2	10.7	71.6	10.7	72.1	10.7
RI	2.5	.3	2.6	.4	3.0	.4	3.1	.5	3.2	.5	3.2	.5
ME	1.5	.2	1.4	.2	1.6	.2	1.4	.2	1.4	.2	1.4	.2
NH	2.0	.3	2.1	.3	1.9	.3	2.1	.3	2.5	.4	2.2	.3
VT	2.6	.3	2.2	.3	2.5	.4	2.6	.4	2.9	.4	2.8	.4
N.E.	100.	13.1	100.	14.0	100.	14.5	100.	14.9	100.	14.9	100.	14.8
U.S.		100.		100.		100.		100.		100.		100.

Note: Figures may not add up to 100 percent due to rounding

Source: NIH Data Books, 1980, 1982, 1984, 1986 and early release data for the 1987 and 1988 editions of the NIH Data Book.

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55. National Institutes of Health Awards by Funding Mechanism: 1986 and 1987 to the New England States

(In thousands of dollars)

1986

	Total	R & D Grants	R & D Contracts	Ind. Trng. Grants/ Fellowships	Instit. Trng. Grants/ Fellowships	Constr. Grants
CT	121,763	107,848	5,045	1,381	7,184	306
MA	473,137	412,165	32,603	6,707	21,283	265
RI	21,352	19,953	898	79	283	0
ME	9,495	8,844	330	0	282	0
NH	16,219	14,565	1,080	109	464	0
VT	18,935	16,930	1,522	57	426	0
N.E.	660,901	580,305	41,478	8,333	29,922	571
*U.S.	4,426,607	3,739,147	462,564	42,754	174,395	4,954

1987

	Total	R & D Grants	R & D Contracts	Ind. Trng. Grants/ Fellowships	Instit. Trng. Grants/ Fellowships	Constr. Grants
CT	139,844	126,579	3,775	1,545	7,946	0
MA	554,986	487,659	36,897	6,819	23,348	263
RI	24,988	23,429	798	65	540	156
ME	10,979	10,531	283	45	120	0
NH	16,855	16,283	63	151	357	0
VT	21,807	18,570	2,489	45	531	172
N.E.	769,459	683,051	44,305	8,670	32,842	591
*U.S.	5,194,164	4,401,188	544,356	46,640	192,127	9,852

*Includes awards to outlying and foreign areas

Source: Early release of data for the 1987 and 1988 edition of the NIH Data Book.
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56. National Institutes of Health Awards to the New England States: 1986 and 1987
Percent Distribution by State
of Each Funding Mechanism
(In percent)

1986

	Total	R & D Grants	R & D Contracts	Ind. Trng. Grants/ Fellowships	Instit. Trng. Grants/ Fellowships	Constr. Grants
U.S. Total	100.	100.	100.	100.	100.	100.
CT	2.8	2.9	1.1	3.2	4.1	6.2
MA	10.7	11.0	7.0	15.7	12.2	5.3
RI	.5	.5	.2	.2	.2	0.
ME	.2	.2	.1	0.	.2	0.
NH	.4	.4	.2	.3	.3	0.
VT	.4	.5	.3	.1	.2	0.
N.E.	14.9	15.5	8.9	19.5	17.2	11.5

1987

	Total	R & D Grants	R & D Contracts	Ind. Trng. Grants/ Fellowships	Instit. Trng. Grants/ Fellowships	Constr. Grants
U.S. Total	100.	100.	100.	100.	100.	100.
CT	2.7	2.9	.7	3.3	4.1	0.
MA	10.7	11.1	6.8	14.6	12.2	2.7
RI	.5	.5	.1	.1	.3	1.6
ME	.2	.2	.1	.1	.1	0.
NH	.3	.4	*	.3	.2	0.
VT	.4	.4	.5	.1	.3	1.7
N.E.	14.8	15.5	8.1	18.6	17.1	6.0

*Less than .05 percent.

Source: NEBHE analysis (7/88) of early release data for the 1987 and 1988 edition of the NIH Data Book.

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57. NIH Funds to New England by Organizational Type: 1986 and 1987

Organization	1986 Total $ Awards	1986 % of Total	1987 Total $ Awards	1987 % of Total
Institutions of Higher Education (excluding Medical School Awards)	132,769.8	20.1	154,382.2	20.1
Medical Schools	251,460.2	38.0	282,062.2	36.7
Independent Teaching Hospitals	178,287.0	27.0	218,721.2	28.4
Other Independent Hospitals	4,184.7	.6	4,980.9	.6
*Other	94,199.3	14.3	109,312.5	14.2
Total Awards to New England	660,901.0	100.0	769,459.0	100.0

*Includes non-profit organizations (research institutes, hospital associations, research centers, etc.), state government departments, and private companies.

Source: NEBHE Analysis (12/87 and 7/88) of Summary of NIH FY Extramural Awards to Domestic Institutions, Summary of NIH FY Extramural Awards to Medical Schools, Summary of NIH FY Extramural Awards to Domestic Institutions of Higher Education, and Summary of NIH FY Extramural Awards to Independent Hospitals, 1986 and 1987 Fiscal Years.

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58. NIH Extramural Funding Awards to All DOMESTIC Institutions: 1986 and 1987
New England Institutions Listed Among the Top 100, Nationally

(In thousands of dollars)

Institution	1987 Total $ Awards	1987 Total # Awards	1987 Natl Rank	1986 Total $ Awards	1986 Total # Awards
*+ Yale University, CT	$104,225.3	504	3	$90,996.2	471
* Harvard University, MA	95,895.2	443	6	84,309.7	440
Brigham & Women's Hospital, MA	51,599.9	207	24	40,111.7	181
M.I.T., MA	51,148.1	229	25	48,030.4	250
Mass. General Hospital, MA	45,378.7	214	32	40,443.2	216
* Boston University, MA	40,538.3	193	36	35,891.5	183
Dana-Farber Cancer Institute, MA	32,780.5	164	44	27,792.6	154
* University of Massachusetts, MA	30,368.9	179	49	22,289.5	162
* University of Connecticut, CT	25,527.4	174	62	23,299.5	175
Children's Hospital, MA	22,194.2	122	65	18,238.7	65
* Tufts University, MA	20,167.9	138	70	20,933.4	145
* Univ. of Vermont State Agric. College, VT	19,161.2	115	75	17,139.0	113
New England Med. Ctr. Hospitals, Inc., MA	17,443.2	99	78	13,322.5	78
* Dartmouth College, NH	16,230.2	112	84	13,891.1	96
Beth Israel Hospital, MA	13,812.0	92	93	12,618.0	80
Total of N.E. Institutions among top 100	586,471.0	2,985		509,307.0	2,862
N.E. Institutions among top 100 as Percent of Total in N.E.	61.0%				76.9%
N.E. Institutions among top 100 as Percent of Total in Nation	11.4%	10.1%		11.6%	10.3%

+ Yale University is 3rd in terms of NIH Fund Awards to Johns Hopkins University and the University of California at San Francisco, respectively. The University of Washington in Seattle is 4th, followed by Stanford University, while Harvard University is 5th.

* Includes funding awarded to the university's medical school

Source: NEBHE Analysis (11/87 & 7/88) of Summary of NIH FY Extramural Awards to Domestic Institutions for Fiscal Years 1986 and 1987: 4/1/87 and 1/21/88.

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59. NIH Extramural Funding Awards to INSTITUTIONS OF HIGHER EDUCATION: 1986 and 1987
National Ranking of New England Institutions

(In thousands of dollars)

Institution	1987 Total $ of Awards	1987 Total # of Awards	1987 National Ranking	1986 Total $ of Awards	1986 Total # of Awards
Yale University (CT)	$104,225.3	504	3	$90,996.2	471
Harvard University (MA	95,895.2	443	6	84,309.7	440
M.I.T. (MA)	51,148.1	229	23	48,030.4	250
Boston University (MA)	40,538.3	193	32	35,891.5	183
University of Massachusetts (MA)	30,368.9	179	42	22,289.5	162
University of Connecticut (CT)	25,527.4	174	54	23,299.5	175
Tufts University (MA)	20,167.9	138	60	20,933.4	145
University of Vermont State Agric. College (VT)	19,161.2	115	62	17,139.0	113
Dartmouth College (NH)	16,230.2	112	70	13,891.1	96
Brandeis University (MA)	10,753.0	75	85	8,952.6	75
Brown University (RI)	10,690.9	79	86	9,487.9	69
Northeastern University (MA)	3,040.0	29	135	2,316.7	22
Boston College (MA)	1,373.2	17	171	886.9	10
University of Lowell (MA)	1,324.8	5	172	577.6	5
University of Rhode Island (RI)	1,092.4	10	185	1,059.5	10
Wesleyan (CT)	1,058.3	10	188	1,033.0	10
Wellesley College (MA)	487.9	6	228	391.5	5
Worcester Polytechnic Institute (MA)	464.0	3	232	158.7	3
Amherst College (MA)	441.5	7	240	406.8	6
University of New Hampshire (NH)	432.1	6	244	419.5	7
Woods Hole Oceanographic Institution (MA)	431.5	3	245	195.5	1
University of Maine, Bangor (ME)	421.4	8	248		
Clark University (MA)	260.5	3	285	362.3	5
Quinnipiac College (CT)	226.8	2	294	145.9	1
Trinity College (CT)	171.7	2	318	152.6	2
Williams College (MA)	81.2	1	376	77.8	1
Bowdoin College (ME)	78.5	1	380	103.5	2
University of New England (ME)	77.3	1	381		
Smith College (MA)	66.7	1	398		
University of Hartford (CT)	66.5	1	399		
Wheaton College (MA)	65.1	1	403		
New England College of Optometry (MA)	49.0	1	427		
Simmons College (MA)	14.6	1	451		
Hampshire College (MA)	13.0	1	453	51.9	1
Southeastern Mass. University (MA)				179.4	2
Middlebury College (CT)				157.9	2
Mount Holyoke College (CT)				156.9	2
Hellenic College (MA)				111.8	1
Springfield College (MA)				63.5	1
Total in New England	436,444.4	2,361		384,230.0	2,278
Total in U.S.	3,886,263.2	23,499		3,326,954.4	22,163
N.E. Total as % of U.S. Total	11.5%	10.3%		11.2%	10.0%

Note: In 1986, of the 458 institutions of higher education receiving NIH Funds, 31 (or 6.8%) are in New England. In 1987, of the 456 institutions received NIH funds; 34 (or 7.5%) are in New England.

Source: NEBHE Analysis (12/87 and 7/88) of Summary of NIH Extramural Awards to Domestic Institutions of Higher Education, for Fiscal Years 1986 and 1987: 8/19/87 and 4/11/88.

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60. NIH Extramural Funding Awards to MEDICAL SCHOOLS: 1986 and 1987
National Ranking of New England Medical Schools

(In thousands of dollars)

1986

Institution	Total $ Awards	Total # of Awards	National Ranking+	Medical School as % of Total Univ. NIH Funds
Yale University Medical School (CT)	78,692.2	388	3	86.5%
Harvard University Medical School (MA)	50,808.2	240	12	60.3%
Boston University School of Medicine (MA)	32,692.3	151	27	91.1%
Tufts University School of Medicine (MA)	18,917.6	125	40	90.4%
U of Massachusetts Medical School (MA)	18,840.4	124	41	84.5%
U of Vermont College of Medicine (VT)	16,081.3	103	48	93.8%
U of Connecticut School of Medicine (CT)	14,713.3	105	51	63.1%
Dartmouth Medical School (NH)	13,039.6	88	57	93.9%
Brown University Program in Medicine (RI)	7,675.3	49	74	80.9%
Total of N.E. Medical Schools	251,460.2	1,373		
Total of U.S. Medical Schools	2,295,226.0	14,151		
N.E. Medical Schools Awards as % of Total Awards to Medical Schools in Nation	11.0%	9.7%		

1987

Institution	Total $ Awards	Total # of Awards	National Ranking+	Medical School as % of Total Univ. NIH Funds
*Yale University Medical School (CT)	89,716.3	414	3	86.1%
Harvard University Medical School (MA)	57,533.3	241	13	60.0%
Boston University School of Medicine (MA)	36,257.0	150	29	89.4%
U of Massachusetts Medical School (MA)	22,598.4	139	36	74.4%
U of Vermont College of Medicine (VT)	18,661.6	108	46	97.4%
Tufts University School of Medicine (MA)	17,315.3	112	52	85.9%
U of Connecticut School of Medicine (CT)	16,280.6	102	55	63.8%
Dartmouth Medical School (NH)	15,131.3	102	58	93.2%
Brown University Program in Medicine (RI)	8,568.4	56	76	80.1%
Total of N.E. Medical Schools	282,062.2	1,424		
Total of U.S. Medical Schools	2,688,815.1	14,826		
N.E. Medical Schools Awards as % of Total Awards to Medical Schools in Nation	10.5%	9.6%		

* In 1987, Yale University is ranked 3rd to University of California at San Francisco and Johns Hopkins University Medical Schools, respectively. Medical Schools ranked 4 through 12 include: Stanford, Columbia, The University of Washington (Seattle), Washington University (St. Louis), Duke University, Albert Einstein College of Yeshiva University, University of Pennsylvania, University of California at Los Angeles and University of Michigan, respectively.

+National Ranking is on Total Dollar Awards rather than Total Number of Awards.

Note: Of the 124 Medical Schools in the U.S. receiving NIH Funds, 9 (or 7.3%) are in New England.

Source: NEBHE Analysis (12/86 and 7/88) of Summary of NIH Extramural Awards to Domestic Institutions of Higher Education, 1986 and 1987; Summary of NIH Extramural Awards to Medical Schools, (1986 and 1987): 8/19/87 and 5/19/88.

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61. NIH Extramural Funding Awards to INDEPENDENT HOSPITALS: 1986 and 1987
National Ranking of New England Independent Hospitals

(In thousands of dollars)

Institution	1987 Total $ of Awards	1987 Total # of Awards	1987 National Ranking	1986 Total $ of Awards	1986 Total # of Awards
*Brigham & Women's Hospital (MA)	51,599.9	207	1	40,111.7	181
Mass. General Hospital (MA)	45,378.7	214	2	40,443.2	216
Dana-Farber Cancer Institute (MA)	32,780.5	164	3	27,792.6	154
*Children's Hospital (MA)	22,194.2	122	4	18,238.7	118
*New England Medical Center Hospitals, Inc. (MA)	17,443.2	99	6	13,322.5	78
*Beth Israel Hospital (MA)	13,812.0	92	7	12,618.0	80
*Massachusetts Eye & Ear (MA)	7,221.0	43	14	5,301.1	37
*New England Deaconess (MA)	5,618.8	27	18	3,708.2	28
*University (MA)	4,712.5	34	20	3,490.0	30
*Rhode Island (RI)	4,254.4	34	22	3,175.3	29
Memorial (RI)	3,574.9	13	25	2,894.1	10
*Boston City (MA)	3,264.5	17	27	2,275.0	13
*St. Elizabeth's (MA)	2,565.8	9	30	1,226.3	9
*Rogers Williams General (RI)	2,366.0	8	32	2,652.9	9
*McLean (MA)	1,944.5	12	34	1,564.5	10
*Miriam (RI)	1,340.2	9	47	1,267.3	8
Hebrew Rehab. Center for Aged (MA)	677.3	2	64	659.7	2
*Berkshire Medical Center (MA)	500.0	1	70		
*Women & Infants (RI)	481.6	4	71	317.0	3
*Maine Medical (ME)	308.7	2	88	163.2	2
Emma Pendleton Bradley (RI)	300.0	2	89	183.7	1
*Hartford (CT)	235.5	2	100	102.7	1
*Baystate Medical (MA)	210.7	1	103	115.4	1
*Bridgeport (CT)	207.9	1	107	107.1	1
New England Memorial (MA)	198.2	2	110	283.2	1
*St. Francis (CT)	112.5	1	139	63.7	1
Rutland Regional Medical Center (VT)	109.8	1	142	68.4	1
*St. Vincent (MA)	107.6	1	143	115.7	1
Eastern Maine Medical Center (ME)	98.2	1	152	66.4	1
*Danbury (CT)	60.5	1	174	57.7	1
Newington Children's (CT)	18.5	1	193	29.2	1
Providence Hospital (MA)			204	4.0	1
*St. Raphael (CT)	57.2	1			
Total in New England	223,702.1	1,128		182,471.7	1,029
Total in U.S.	410,134.8	2,319		335,417.3	2,106
N.E. Total as % of U.S. Total	54.5%	48.6%		54.4%	48.9%

Note #1: Of the 207 Independent Hospitals that received NIH Funds in 1987, 32 (or 15.5%) are located in New England.

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